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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1883

FIRST EDITION

PUBLISHED BY AUTHORITY OF THE SECRETARY OF THE NAVY

WASHINGTON
BUREAU OF NAVIGATION
1880

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PREFACE.

THE contents of the present volume of the *American Ephemeris* are, in general, similar to those of the volume for the preceding year. Beginning with the volume for the year 1882, the arrangement of the work is as follows:—

Part I, *Ephemeris for the Meridian of Greenwich*, gives the positions of all the bodies of the solar system and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, gives principally ephemerides of the fixed stars, sun, moon, and major planets for transit over the meridian of Washington. The mean places of the fixed stars and data for their reduction are also included in this part. The list of mean places of fixed stars has been greatly enlarged, for the convenience of field-astronomers.

Part III, *Phenomena*, contains predictions of phenomena to be observed with data for their computation. Washington mean time is used in this part except in a few cases, notably that of eclipses, where Greenwich mean time was judged more convenient. The additions comprise more complete data for eclipses of the sun, diagrams showing the configurations of the satellites of Jupiter, data respecting the disks of Mercury and Venus for the reduction of meridian and photometric observations, and diagrams, with tables, for identifying any known satellites of other planets.

SIMON NEWCOMB,
Professor U. S. Navy, Superintendent.

WASHINGTON, *September* 30, 1880.

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CORRECTIONS.

EPHEMERIS FOR 1881 (FIRST AND SECOND EDITIONS).

(Continued from page VI *of the second edition of the Ephemeris for* 1881.)

Page 128, August 12, last column, *for* 0.626 *read* 0.426

EPHEMERIS FOR 1882 (FIRST EDITION).

(Continued from page VI.*of the first edition of the Ephemeris for* 1882.)

276, column Δ requires a correction of + 7′.9 throughout the year.

278, precession for 1882.5, *for* 50″.2594 *read* 50″.2598

396 and 397, the mean time of transit of Neptune requires to be diminished by 4^m from Sept. 1 till December 32, and the apparent right ascensions and declinations between the same dates, to be increased by the motion in 4 minutes.

407, line three from bottom, *for* $\frac{m}{6}$ *read* $\frac{m}{b}$

507, line twelve, *for* $x' - \zeta'$ *read* $x' - \xi'$

508, line four, *for* $\mathcal{N} - 90^\circ + \psi$ *read* $\mathcal{N} + \psi - 180^\circ$

508, line five, *for* $\mathcal{N} - 90^\circ - \psi$ *read* $\mathcal{N} + \psi + 180^\circ$

510, lines five to eight, make the computation of position angle read as follows:—

	Immersion.	Emersion.
$\mathcal{N}$	91° 22′	91° 2′
ψ	204 2	— 24 9
	—180	180
Q	115 24	246 53

EPHEMERIS FOR 1883 (FIRST EDITION).

167, October 9, semidiameter at noon, *for* 15′ 19″.1 *read* 15′ 19″.9

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1883, WHICH COMPRISES THE LATTER PART OF THE 107TH AND THE BEGINNING OF THE 108TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6596 of the Julian Period;
" 7391–92 of the Byzantine era, the year 7392 commencing on September 1st;
" 5643–44 of the Jewish era, the year 5644 commencing on October 2d, or, more exactly, at sunset on October 1st;
" 2636 since the foundation of Rome, according to VARRO;
" 2630 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period: corresponding, in the notation of chronologists, to the 747th; and, in the notation of astronomers, to the 746th year before the birth of CHRIST;
" 2659 of the Olympiads, or the third year of the 665th Olympiad commencing in July, 1883, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;
" 2195 of the Grecian era, or the era of the Seleucidæ;
" 1599 of the era of DIOCLETIAN.

The year 1301 of the Mohammedan era, or the era of the Hegira, begins on the 2d day of November, 1883.

The first day of January of the year 1883 is the 2,408,812th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	G	Solar Cycle	16
Epact	22	Roman Indiction	11
Lunar Cycle or Golden Number	3	Julian Period	6596

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittarius.
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricornus.
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌ Conjunction, or having the same Longitude or Right Ascension.
□ Quadrature, or differing 90° in Longitude or Right Ascension.
☍ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	18 46 56.68	11.043	S. 23 0 49.9	+ 12.39	16 18.38	71.08	3 45.11	1.182
Tues.	2	18 51 21.56	11.029	22 55 38.7	13.54	16 18.37	71.03	4 13.34	1.169
Wed.	3	18 55 46.08	11.015	22 50 0.2	14.68	16 18.36	70.98	4 41.23	1.154
Thur.	4	19 0 10.23	10.998	22 43 54.5	+ 15.81	16 18.34	70.93	5 8.75	1.138
Frid.	5	19 4 33.99	10.981	22 37 21.7	16.94	16 18.33	70.87	5 35.87	1.121
Sat.	6	19 8 57.32	10.962	22 30 21.8	18.05	16 18.30	70.81	6 2.58	1.102
Sun.	7	19 13 20.19	10.942	22 22 55.3	+ 19.15	16 18.27	70.74	6 28.83	1.082
Mon.	8	19 17 42.57	10.922	22 15 2.4	20.25	16 18.24	70.67	6 54.57	1.061
Tues.	9	19 22 4.42	10.899	22 6 43.4	21.35	16 18.20	70.60	7 19.79	1.039
Wed.	10	19 26 25.72	10.875	21 57 58.3	+ 22.42	16 18.16	70.53	7 44.47	1.016
Thur.	11	19 30 46.43	10.851	21 48 47.5	23.48	16 18.11	70.45	8 8.56	0.991
Frid.	12	19 35 6.54	10.825	21 39 11.3	24.53	16 18.06	70.37	8 32.05	0.965
Sat.	13	19 39 26.02	10.798	21 29 10.0	+ 25.58	16 18.01	70.29	8 54.90	0.938
Sun.	14	19 43 44.84	10.770	21 18 43.8	26.60	16 17.95	70.20	9 17.10	0.910
Mon.	15	19 48 2.98	10.741	21 7 53.2	27.61	16 17.89	70.11	9 38.62	0.881
Tues.	16	19 52 20.41	10.711	20 56 38.4	+ 28.61	16 17.83	70.01	9 59.44	0.852
Wed.	17	19 56 37.12	10.681	20 44 59.7	29.60	16 17.76	69.91	10 19.54	0.822
Thur.	18	20 0 53.10	10.650	20 32 57.5	30.57	16 17.68	69.81	10 38.92	0.791
Frid.	19	20 5 8.34	10.620	20 20 32.0	+ 31.54	16 17.60	69.71	10 57.55	0.760
Sat.	20	20 9 22.83	10.588	20 7 43.5	32.48	16 17.51	69.61	11 15.43	0.729
Sun.	21	20 13 36.54	10.556	19 54 32.5	33.41	16 17.42	69.51	11 32.54	0.697
Mon.	22	20 17 49.47	10.523	19 40 59.3	+ 34.34	16 17.32	69.40	11 48.87	0.664
Tues.	23	20 22 1.61	10.490	19 27 4.2	35.24	16 17.21	69.29	12 4.41	0.631
Wed.	24	20 26 12.96	10.457	19 12 47.5	36.13	16 17.10	69.18	12 19.17	0.598
Thur.	25	20 30 23.53	10.423	18 58 9.7	+ 37.01	16 16.99	69.07	12 33.15	0.565
Frid.	26	20 34 33.31	10.390	18 43 11.0	37.87	16 16.87	68.96	12 46.34	0.532
Sat.	27	20 38 42.29	10.357	18 27 51.8	38.72	16 16.74	68.85	12 58.73	0.499
Sun.	28	20 42 50.47	10.324	18 12 12.5	+ 39.55	16 16.60	68.74	13 10.32	0.466
Mon.	29	20 46 57.85	10.291	17 56 13.6	40.36	16 16.46	68.62	13 21.10	0.433
Tues.	30	20 51 4.43	10.257	17 39 55.3	41.16	16 16.31	68.51	13 31.09	0.399
Wed.	31	20 55 10.20	10.224	17 23 18.0	41.93	16 16.16	68.40	13 40.29	0.366
Thur.	32	20 59 15.16	10.190	S. 17 6 22.4	+ 42.69	16 16.01	68.28	13 48.68	0.332

NOTE.—The mean time of semidiameter passing may be found by subtracting 0ˢ.19 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	18 46 55.99	11.039	S. 23 0 50.7	+12.38	3 45.03	1.182	18 43 10.96
Tues.	2	18 51 20.79	11.026	22 55 39.7	13.53	4 13.27	1.169	18 47 7.52
Wed.	3	18 55 45.22	11.012	22 50 1.4	14.67	4 41.14	1.154	18 51 4.08
Thur.	4	19 0 9.29	10.996	22 43 55.8	+15.80	5 8.65	1.138	18 55 0.64
Frid.	5	19 4 32.97	10.978	22 37 23.2	16.93	5 35.77	1.121	18 58 57.20
Sat.	6	19 8 56.22	10.959	22 30 23.6	18.04	6 2.47	1.102	19 2 53.75
SUN.	7	19 13 19.01	10.939	22 22 57.4	+19.14	6 28.70	1.082	19 6 50.31
Mon.	8	19 17 41.31	10.919	22 15 4.7	20.24	6 54.45	1.061	19 10 46.86
Tues.	9	19 22 3.08	10.897	22 6 45.9	21.34	7 19.67	1.039	19 14 43.42
Wed.	10	19 26 24.32	10.873	21 58 1.1	+22.41	7 44.34	1.016	19 18 39.98
Thur.	11	19 30 44.96	10.848	21 48 50.6	23.47	8 8.42	0.991	19 22 36.54
Frid.	12	19 35 5.00	10.822	21 39 14.7	24.52	8 31.91	0.965	19 26 33.09
Sat.	13	19 39 24.41	10.795	21 29 13.7	+25.57	8 54.76	0.938	19 30 29.65
SUN.	14	19 43 43.17	10.767	21 18 47.9	26.59	9 16.96	0.910	19 34 26.21
Mon.	15	19 48 1.25	10.738	21 7 57.6	27.60	9 38.48	0.881	19 38 22.77
Tues.	16	19 52 18.62	10.709	20 56 43.2	+28.60	9 59.30	0.852	19 42 19.32
Wed.	17	19 56 35.28	10.679	20 45 4.8	29.59	10 19.40	0.822	19 46 15.88
Thur.	18	20 0 51.21	10.648	20 33 2.9	30.56	10 38.78	0.791	19 50 12.43
Frid.	19	20 5 6.40	10.618	20 20 37.7	+31.53	10 57.41	0.760	19 54 8.99
Sat.	20	20 9 20.84	10.586	20 7 49.6	32.47	11 15.29	0.729	19 58 5.55
SUN.	21	20 13 34.51	10.554	19 54 38.9	33.40	11 32.40	0.697	20 2 2.11
Mon.	22	20 17 47.40	10.521	19 41 6.0	+34.33	11 48.74	0.664	20 5 58.66
Tues.	23	20 21 59.50	10.488	19 27 11.2	35.23	12 4.28	0.631	20 9 55.22
Wed.	24	20 26 10.82	10.455	19 12 54.9	36.12	12 19.05	0.598	20 13 51.77
Thur.	25	20 30 21.36	10.422	18 58 17.4	+37 00	12 33.03	0.565	20 17 48.33
Frid.	26	20 34 31.11	10.389	18 43 19.0	37.86	12 46.23	0.532	20 21 44.88
Sat.	27	20 38 40.06	10.356	18 28 0.1	38.70	12 58.62	0.499	20 25 41.44
SUN.	28	20 42 48.21	10.323	18 12 21.2	+39.54	13 10.22	0.466	20 29 37.99
Mon.	29	20 46 55.56	10.290	17 56 22.6	40.35	13 21.01	0.433	20 33 34.55
Tues.	30	20 51 2.12	10.256	17 40 4.5	41.15	13 31.01	0.399	20 37 31.10
Wed.	31	20 55 7.87	10.223	17 23 27.6	41.92	13 40.21	0.366	20 41 27.66
Thur.	32	20 59 12.82	10.189	S. 17 6 32.3	+42.68	13 48.61	0.332	20 45 24.21

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour, + $9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.								
		THE SUN'S						
Day of the Month.	Day of the Year.	TRUE LONGITUDE. λ	TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	1	280 47 36.6	47 22.9	152.89	− 0.11	9.9926680	+ 1.0	5 15 57.12
2	2	281 48 46.5	48 32.6	152.91	+ 0.02	9.9926715	1.9	5 12 1.21
3	3	282 49 56.7	49 42.6	152.93	0.15	9.9926772	2.8	5 8 5.30
4	4	283 51 7.1	50 52.8	152.94	+ 0.27	9.9926850	+ 3.6	5 4 9.40
5	5	284 52 17.6	52 3.2	152.94	0.39	9.9926946	4.4	5 0 13.49
6	6	285 53 28.1	53 13.5	152.94	0.51	9.9927060	5.1	4 56 17.58
7	7	286 54 38.6	54 23.8	152.94	+ 0.63	9.9927191	+ 5.8	4 52 21.67
8	8	287 55 48.9	55 33.9	152.94	0.73	9.9927339	6.5	4 48 25.76
9	9	288 56 58.9	56 43.8	152.92	0.79	9.9927504	7.2	4 44 29.85
10	10	289 58 8.6	57 53.4	152.90	+ 0.81	9.9927686	+ 7.9	4 40 33.94
11	11	290 59 18.0	59 2.6	152.88	0.81	9.9927884	8.6	4 36 38.03
12	12	292 0 26.9	0 11.3	152.85	0.79	9.9928098	9.3	4 32 42.11
13	13	293 1 35.1	1 19.3	152.82	+ 0.74	9.9928330	+ 10.0	4 28 46.20
14	14	294 2 42.5	2 26.6	152.79	0.66	9.9928581	10.8	4 24 50.29
15	15	295 3 49.1	3 33.1	152.76	0.56	9.9928852	11.7	4 20 54.38
16	16	296 4 55.0	4 38.8	152.73	+ 0.44	9.9929144	+ 12.6	4 16 58.46
17	17	297 6 0.0	5 43.6	152.69	0.31	9.9929458	13.6	4 13 2.55
18	18	298 7 4.2	6 47.7	152.65	0.18	9.9929796	14.6	4 9 6.64
19	19	299 8 7.5	7 50.9	152.62	+ 0.04	9.9930159	+ 15.6	4 5 10.73
20	20	300 9 9.8	8 53.1	152.58	− 0.07	9.9930547	16.7	4 1 14.82
21	21	301 10 11.2	9 54.3	152.55	0.17	9.9930961	17.8	3 57 18.91
22	22	302 11 11.8	10 54.7	152.51	− 0.24	9.9931401	+ 18.9	3 53 23.00
23	23	303 12 11.5	11 54.3	152.48	0.29	9.9931868	20.0	3 49 27.09
24	24	304 13 10.4	12 53.1	152.45	0.31	9.9932361	21.1	3 45 31.18
25	25	305 14 8.5	13 51.1	152.41	− 0.28	9.9932881	+ 22.2	3 41 35.26
26	26	306 15 5.9	14 48.3	152.38	0.24	9.9933427	23.3	3 37 39.35
27	27	307 16 2.5	15 44.7	152.35	0.16	9.9933999	24.3	3 33 43.44
28	28	308 16 58.4	16 40.5	152.31	− 0.07	9.9934595	+ 25.3	3 29 47.53
29	29	309 17 53.6	17 35.6	152.28	+ 0.05	9.9935213	26.2	3 25 51.63
30	30	310 18 48.0	18 29.9	152.25	0.18	9.9935853	27.1	3 21 55.72
31	31	311 19 41.6	19 23.3	152.22	0.32	9.9936513	27.9	3 17 59.81
32	32	312 20 34.5	20 16.0	152.19	+ 0.45	9.9937192	+ 28.7	3 14 3.91

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 48.8	14 50.0	54 15.0	+ 0.25	54 19.3	+ 0.47	18 21.8	1.80	21.8
2	14 51.9	14 54.5	54 26.3	0.69	54 35.8	0.89	19 6.0	1.86	22.8
3	14 57.7	15 1.6	54 47.8	1.10	55 2.1	1.28	19 52.4	1.99	23.8
4	15 6.1	15 11.0	55 18.5	+ 1.44	55 36.7	+ 1.58	20 41.5	2.11	24.8
5	15 16.4	15 22.1	55 56.5	1.69	56 17.3	1.77	21 33.4	2.22	25.8
6	15 28.0	15 34.1	56 39.1	1.83	57 1.2	1.84	22 27.5	2.29	26.8
7	15 40.1	15 46.0	57 23.3	+ 1.82	57 44.9	+ 1.76	23 23.0	2.33	27.8
8	15 51.6	15 56.9	58 5.6	1.67	58 25.0	1.54	☌		28.8
9	16 1.7	16 5.9	58 42.6	1.38	58 58.2	1.20	0 18.8	2.31	0.3
10	16 9.5	16 12.4	59 11.4	+ 0.99	59 22.1	+ 0.78	1 14.0	2.27	1.3
11	16 14.6	16 16.1	59 30.2	0.57	59 35.8	+ 0.35	2 7.9	2.22	2.3
12	16 16.9	16 17.1	59 38.7	+ 0.14	59 39.3	− 0.05	3 0.6	2.17	3.3
13	16 16.6	16 15.7	59 37.6	− 0.22	59 34.0	− 0.38	3 52.5	2.15	4.3
14	16 14.1	16 12.3	59 28.4	0.52	59 21.5	0.63	4 44.1	2.16	5.3
15	16 10.0	16 7.5	59 13.2	0.73	59 3.9	0.81	5 36.3	2.19	6.3
16	16 4.7	16 1.7	58 53.8	− 0.87	58 42.9	− 0.93	6 29.5	2.24	7.3
17	15 58.6	15 55.4	58 31.5	0.97	58 19.5	1.02	7 23.8	2.29	8.3
18	15 52.0	15 48.5	58 7.2	1.05	57 54.3	1.09	8 19.1	2.31	9.3
19	15 44.9	15 41.2	57 41.1	− 1.12	57 27.5	− 1.15	9 14.6	2.30	10.3
20	15 37.4	15 33.5	57 13.6	1.17	56 59.3	1.20	10 9.3	2.25	11.3
21	15 29.6	15 25.6	56 44.8	1.22	56 30.1	1.23	11 2.3	2.16	12.3
22	15 21.5	15 17.5	56 15.2	− 1.24	56 0.4	− 1.23	11 52.9	2.05	13.3
23	15 13.5	15 9.7	55 45.6	1.20	55 31.0	1.17	12 40.9	1.94	14.3
24	15 5.8	15 2.2	55 17.3	1.14	55 4.2	1.06	13 26.5	1.85	15.3
25	14 58.8	14 55.8	54 51.9	− 0.97	54 40.7	− 0.87	14 10.2	1.79	16.3
26	14 53.1	14 50.9	54 30.9	0.76	54 22.6	0.62	14 52.7	1.75	17.3
27	14 49.1	14 47.9	54 16.1	0.46	54 11.6	− 0.29	15 34.7	1.75	18.3
28	14 47.2	14 47.1	54 9.1	− 0.11	54 8.9	+ 0.09	16 16.9	1.77	19.3
29	14 47.8	14 49.0	54 11.2	+ 0.29	54 15.9	0.50	17 0.0	1.83	20.3
30	14 51.0	14 53.7	54 23.2	0.72	54 33.1	0.93	17 44.8	1.91	21.3
31	14 57.1	15 1.2	54 45.5	1.14	55 0.5	1.35	18 31.8	2.01	22.3
32	15 5.9	15 11.3	55 17.9	+ 1.55	55 37.6	+ 1.72	19 21.3	2.12	23.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 33 10.72	1.8769	S. 7 5 7.0	9.742
1	12 35 3.38	1.8785	7 14 50.8	9.716
2	12 36 56.14	1.8802	7 24 32.9	9.688
3	12 38 49.00	1.8819	7 34 13.3	9.660
4	12 40 41.97	1.8837	7 43 52.1	9.632
5	12 42 35.05	1.8856	7 53 29.1	9.602
6	12 44 28.24	1.8875	8 3 4.3	9.572
7	12 46 21.55	1.8895	8 12 37.7	9.542
8	12 48 14.98	1.8914	8 22 9.3	9.511
9	12 50 8.52	1.8934	8 31 39.0	9.479
10	12 52 2.18	1.8955	8 41 6.8	9.447
11	12 53 55.98	1.8977	8 50 32.6	9.414
12	12 55 49.91	1.8999	8 59 56.4	9.381
13	12 57 43.97	1.9022	9 9 18.3	9.347
14	12 59 38.17	1.9045	9 18 38.1	9.312
15	13 1 32.51	1.9068	9 27 55.8	9.277
16	13 3 26.99	1.9092	9 37 11.4	9.242
17	13 5 21.61	1.9116	9 46 24.8	9.206
18	13 7 16.38	1.9141	9 55 36.1	9.169
19	13 9 11.30	1.9167	10 4 45.1	9.131
20	13 11 6.38	1.9192	10 13 51.8	9.093
21	13 13 1.61	1.9218	10 22 56.3	9.055
22	13 14 57.00	1.9246	10 31 58.4	9.015
23	13 16 52.56	1.9273	S. 10 40 58.1	8.975

TUESDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 18 48.28	1.9301	S. 10 49 55.4	8.934
1	13 20 44.17	1.9329	10 58 50.2	8.893
2	13 22 40.23	1.9357	11 7 42.5	8.852
3	13 24 36.46	1.9387	11 16 32.4	8.810
4	13 26 32.87	1.9417	11 25 19.7	8.767
5	13 28 29.46	1.9447	11 34 4.4	8.723
6	13 30 26.23	1.9477	11 42 46.4	8.678
7	13 32 23.18	1.9508	11 51 25.8	8.633
8	13 34 20.32	1.9539	12 0 2.4	8.588
9	13 36 17.65	1.9571	12 8 36.3	8.542
10	13 38 15.17	1.9603	12 17 7.4	8.494
11	13 40 12.88	1.9635	12 25 35.6	8.446
12	13 42 10.79	1.9668	12 34 0.9	8.397
13	13 44 8.90	1.9702	12 42 23.3	8.349
14	13 46 7.21	1.9735	12 50 42.8	8.300
15	13 48 5.72	1.9769	12 58 59.3	8.249
16	13 50 4.44	1.9804	13 7 12.7	8.198
17	13 52 3.37	1.9839	13 15 23.0	8.147
18	13 54 2.51	1.9874	13 23 30.3	8.095
19	13 56 1.86	1.9910	13 31 34.4	8.041
20	13 58 1.43	1.9946	13 39 35.2	7.987
21	14 0 1.21	1.9982	13 47 32.8	7.932
22	14 2 1.21	2.0018	13 55 27.1	7.877
23	14 4 1.43	2.0056	14 3 18.1	7.822
24	14 6 1.88	2.0093	S. 14 11 5.7	7.765

WEDNESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 6 1.88	2.0093	S. 14 11 5.7	7.765
1	14 8 2.55	2.0131	14 18 49.9	7.707
2	14 10 3.45	2.0169	14 26 30.6	7.650
3	14 12 4.58	2.0208	14 34 7.9	7.592
4	14 14 5.94	2.0247	14 41 41.6	7.532
5	14 16 7.54	2.0286	14 49 11.7	7.471
6	14 18 9.37	2.0325	14 56 38.1	7.410
7	14 20 11.44	2.0364	15 4 0.9	7.348
8	14 22 13.74	2.0403	15 11 19.9	7.286
9	14 24 16.28	2.0444	15 18 35.2	7.223
10	14 26 19.07	2.0485	15 25 46.7	7.159
11	14 28 22.10	2.0525	15 32 54.3	7.094
12	14 30 25.37	2.0566	15 39 58.0	7.029
13	14 32 28.89	2.0607	15 46 57.8	6.963
14	14 34 32.66	2.0648	15 53 53.6	6.896
15	14 36 36.67	2.0690	16 0 45.3	6.828
16	14 38 40.94	2.0732	16 7 32.9	6.759
17	14 40 45.46	2.0774	16 14 16.4	6.690
18	14 42 50.23	2.0817	16 20 55.7	6.620
19	14 44 55.26	2.0859	16 27 30.8	6.549
20	14 47 0.54	2.0901	16 34 1.6	6.477
21	14 49 6.07	2.0943	16 40 28.1	6.405
22	14 51 11.86	2.0986	16 46 50.2	6.332
23	14 53 17.91	2.1029	S. 16 53 7.9	6.258

THURSDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 55 24.21	2.1073	S. 16 59 21.2	6.183
1	14 57 30.78	2.1116	17 5 29.9	6.108
2	14 59 37.61	2.1159	17 11 34.1	6.032
3	15 1 44.69	2.1202	17 17 33.7	5.955
4	15 3 52.03	2.1246	17 23 28.7	5.877
5	15 5 59.64	2.1290	17 29 18.9	5.798
6	15 8 7.51	2.1333	17 35 4.4	5.718
7	15 10 15.64	2.1377	17 40 45.1	5.638
8	15 12 24.03	2.1421	17 46 21.0	5.557
9	15 14 32.69	2.1465	17 51 52.0	5.475
10	15 16 41.61	2.1508	17 57 18.0	5.393
11	15 18 50.79	2.1552	18 2 39.1	5.310
12	15 21 0.24	2.1597	18 7 55.2	5.226
13	15 23 9.95	2.1640	18 13 6.2	5.140
14	15 25 19.92	2.1684	18 18 12.0	5.054
15	15 27 30.16	2.1728	18 23 12.7	4.967
16	15 29 40.66	2.1772	18 28 8.1	4.880
17	15 31 51.42	2.1815	18 32 58.3	4.792
18	15 34 2.44	2.1858	18 37 43.2	4.703
19	15 36 13.72	2.1902	18 42 22.7	4.613
20	15 38 25.26	2.1946	18 46 56.8	4.522
21	15 40 37.07	2.1990	18 51 25.4	4.431
22	15 42 49.14	2.2033	18 55 48.5	4.339
23	15 45 1.46	2.2075	19 0 6.1	4.247
24	15 47 14.04	2.2118	S. 19 4 18.1	4.153

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					SUNDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 47 14.04	2.2118	S.19 4 18.1	4.153	0	17 37 44.40	2.3747	S.20 22 33.7	1.116
1	15 49 26.87	2.2160	19 8 24.4	4.058	1	17 40 6.95	2.3768	20 21 23.1	1.237
2	15 51 39.96	2.2203	19 12 25.0	3.963	2	17 42 29.62	2.3788	20 20 5.2	1.358
3	15 53 53.31	2.2246	19 16 20.0	3.868	3	17 44 52.41	2.3807	20 18 40.1	1.480
4	15 56 6.91	2.2288	19 20 9.2	3.771	4	17 47 15.31	2.3826	20 17 7.6	1.602
5	15 58 20.76	2.2330	19 23 52.5	3.673	5	17 49 38.32	2.3844	20 15 27.8	1.724
6	16 0 34.87	2.2372	19 27 30.0	3.576	6	17 52 1.44	2.3862	20 13 40.7	1.847
7	16 2 49.23	2.2413	19 31 1.6	3.477	7	17 54 24.66	2.3878	20 11 46.2	1.970
8	16 5 3.83	2.2453	19 34 27.2	3.377	8	17 56 47.97	2.3893	20 9 44.3	2.092
9	16 7 18.67	2.2494	19 37 46.8	3.277	9	17 59 11.37	2.3908	20 7 35.1	2.215
10	16 9 33.76	2.2535	19 41 0.4	3.175	10	18 1 34.86	2.3922	20 5 18.5	2.338
11	16 11 49.09	2.2576	19 44 7.8	3.072	11	18 3 58.43	2.3936	20 2 54.5	2.461
12	16 14 4.67	2.2617	19 47 9.1	2.970	12	18 6 22.09	2.3949	20 0 23.2	2.583
13	16 16 20.49	2.2656	19 50 4.2	2.867	13	18 8 45.82	2.3961	19 57 44.5	2.707
14	16 18 36.54	2.2694	19 52 53.1	2.763	14	18 11 9.62	2.3972	19 54 58.4	2.830
15	16 20 52.82	2.2733	19 55 35.8	2.659	15	18 13 33.48	2.3982	19 52 4.9	2.953
16	16 23 9.33	2.2772	19 58 12.2	2.553	16	18 15 57.41	2.3992	19 49 4.0	3.077
17	16 25 26.08	2.2811	20 0 42.2	2.447	17	18 18 21.39	2.4001	19 45 55.7	3.199
18	16 27 43.06	2.2848	20 3 5.9	2.341	18	18 20 45.42	2.4009	19 42 40.1	3.322
19	16 30 0.26	2.2886	20 5 23.1	2.234	19	18 23 9.50	2.4017	19 39 17.1	3.445
20	16 32 17.69	2.2923	20 7 33.9	2.126	20	18 25 33.63	2.4025	19 35 46.7	3.567
21	16 34 35.34	2.2959	20 9 38.2	2.017	21	18 27 57.80	2.4031	19 32 9.0	3.690
22	16 36 53.20	2.2995	20 11 35.9	1.907	22	18 30 22.00	2.4036	19 28 23.9	3.812
23	16 39 11.28	2.3032	S.20 13 27.0	1.797	23	18 32 46.23	2.4041	S.19 24 31.5	3.934
	SATURDAY 6.					MONDAY 8.			
0	16 41 29.58	2.3067	S.20 15 11.6	1.687	0	18 35 10.49	2.4045	S.19 20 31.8	4.057
1	16 43 48.09	2.3102	20 16 49.5	1.576	1	18 37 34.77	2.4048	19 16 24.7	4.178
2	16 46 6.80	2.3136	20 18 20.7	1.464	2	18 39 59.07	2.4052	19 12 10.4	4.299
3	16 48 25.72	2.3170	20 19 45.2	1.352	3	18 42 23.39	2.4054	19 7 48.8	4.421
4	16 50 44.84	2.3203	20 21 2.9	1.239	4	18 44 47.72	2.4055	19 3 19.9	4.542
5	16 53 4.16	2.3236	20 22 13.8	1.126	5	18 47 12.05	2.4056	18 58 43.8	4.662
6	16 55 23.67	2.3268	20 23 18.0	1.012	6	18 49 36.39	2.4057	18 54 0.4	4.783
7	16 57 43.38	2.3301	20 24 15.3	0.897	7	18 52 0.73	2.4056	18 49 9.8	4.903
8	17 0 3.28	2.3332	20 25 5.7	0.782	8	18 54 25.06	2.4054	18 44 12.0	5.022
9	17 2 23.36	2.3362	20 25 49.1	0.666	9	18 56 49.38	2.4052	18 39 7.1	5.142
10	17 4 43.62	2.3392	20 26 25.6	0.551	10	18 59 13.69	2.4050	18 33 55.0	5.261
11	17 7 4.06	2.3422	20 26 55.2	0.435	11	19 1 37.98	2.4047	18 28 35.8	5.378
12	17 9 24.68	2.3451	20 27 17.8	0.318	12	19 4 2.25	2.4043	18 23 9.6	5.496
13	17 11 45.47	2.3479	20 27 33.4	0.201	13	19 6 26.50	2.4038	18 17 36.3	5.614
14	17 14 6.43	2.3507	20 27 41.9	− 0.083	14	19 8 50.71	2.4032	18 11 55.9	5.731
15	17 16 27.55	2.3533	20 27 43.3	+ 0.036	15	19 11 14.89	2.4027	18 6 8.5	5.847
16	17 18 48.83	2.3560	20 27 37.6	0.154	16	19 13 39.04	2.4022	18 0 14.2	5.963
17	17 21 10.27	2.3586	20 27 24.8	0.273	17	19 16 3.15	2.4015	17 54 12.9	6.079
18	17 23 31.86	2.3611	20 27 4.8	0.392	18	19 18 27.22	2.4008	17 48 4.7	6.194
19	17 25 53.60	2.3635	20 26 37.7	0.512	19	19 20 51.25	2.4000	17 41 49.6	6.308
20	17 28 15.48	2.3659	20 26 3.4	0.632	20	19 23 15.22	2.3991	17 35 27.7	6.422
21	17 30 37.51	2.3683	20 25 21.8	0.753	21	19 25 39.14	2.3982	17 28 59.0	6.535
22	17 32 59.68	2.3706	20 24 33.0	0.873	22	19 28 3.01	2.3972	17 22 23.5	6.647
23	17 35 21.98	2.3727	20 23 37.0	0.994	23	19 30 26.81	2.3962	17 15 41.3	6.758
24	17 37 44.40	2.3747	S.20 22 33.7	1.116	24	19 32 50.55	2.3952	S.17 8 52.5	6.869

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 9.					THURSDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 32 50.55	2.3952	S. 17 8 52.5	6.869	0	21 25 55.40	2.3093	S. 9 47 56.8	11.100
1	19 35 14.23	2.3941	17 1 57.0	6.980	1	21 28 13.90	2.3073	9 36 49.0	11.160
2	19 37 37.84	2.3929	16 54 54.9	7.090	2	21 30 32.28	2.3054	9 25 37.6	11.219
3	19 40 1.38	2.3917	16 47 46.2	7.199	3	21 32 50.55	2.3035	9 14 22.7	11.277
4	19 42 24.84	2.3904	16 40 31.0	7.307	4	21 35 8.70	2.3015	9 3 4.3	11.334
5	19 44 48.23	2.3892	16 33 9.4	7.414	5	21 37 26.73	2.2995	8 51 42.6	11.388
6	19 47 11.54	2.3878	16 25 41.3	7.521	6	21 39 44.64	2.2976	8 40 17.7	11.442
7	19 49 34.77	2.3864	16 18 6.8	7.627	7	21 42 2.44	2.2957	8 28 49.6	11.495
8	19 51 57.91	2.3850	16 10 26.1	7.731	8	21 44 20.13	2.2939	8 17 18.3	11.547
9	19 54 20.97	2.3836	16 2 39.1	7.835	9	21 46 37.71	2.2921	8 5 44.0	11.596
10	19 56 43.94	2.3820	15 54 45.9	7.939	10	21 48 55.18	2.2902	7 54 6.8	11.645
11	19 59 6.81	2.3804	15 46 46.4	8.042	11	21 51 12.54	2.2884	7 42 26.6	11.693
12	20 1 29.59	2.3788	15 38 40.8	8.143	12	21 53 29.79	2.2866	7 30 43.6	11.739
13	20 3 52.27	2.3772	15 30 29.2	8.244	13	21 55 46.93	2.2848	7 18 57.9	11.783
14	20 6 14.86	2.3757	15 22 11.5	8.344	14	21 58 3.97	2.2831	7 7 9.6	11.827
15	20 8 37.35	2.3740	15 13 47.9	8.442	15	22 0 20.91	2.2814	6 55 18.7	11.869
16	20 10 59.74	2.3722	15 5 18.4	8.540	16	22 2 37.74	2.2798	6 43 25.3	11.910
17	20 13 22.02	2.3705	14 56 43.1	8.637	17	22 4 54.48	2.2782	6 31 29.5	11.950
18	20 15 44.20	2.3687	14 48 2.0	8.733	18	22 7 11.12	2.2765	6 19 31.3	11.988
19	20 18 6.27	2.3669	14 39 15.1	8.828	19	22 9 27.66	2.2748	6 7 30.9	12.025
20	20 20 28.23	2.3652	14 30 22.6	8.922	20	22 11 44.10	2.2732	5 55 28.3	12.061
21	20 22 50.09	2.3634	14 21 24.5	9.015	21	22 14 0.45	2.2717	5 43 23.6	12.095
22	20 25 11.84	2.3615	14 12 20.8	9.107	22	22 16 16.71	2.2702	5 31 16.9	12.127
23	20 27 33.47	2.3596	S. 14 3 11.7	9.197	23	22 18 32.88	2.2687	S. 5 19 8.3	12.159
	WEDNESDAY 10.					FRIDAY 12.			
0	20 29 54.98	2.3576	S. 13 53 57.2	9.287	0	22 20 48.96	2.2673	S. 5 6 57.8	12.190
1	20 32 16.38	2.3557	13 44 37.3	9.376	1	22 23 4.96	2.2659	4 54 45.5	12.219
2	20 34 37.66	2.3537	13 35 12.1	9.463	2	22 25 20.87	2.2645	4 42 31.5	12.246
3	20 36 58.83	2.3518	13 25 41.7	9.550	3	22 27 36.70	2.2632	4 30 16.0	12.272
4	20 39 19.88	2.3498	13 16 6.1	9.636	4	22 29 52.45	2.2619	4 17 58.9	12.297
5	20 41 40.81	2.3478	13 6 25.4	9.720	5	22 32 8.13	2.2607	4 5 40.3	12.321
6	20 44 1.62	2.3458	12 56 39.7	9.802	6	22 34 23.73	2.2594	3 53 20.4	12.343
7	20 46 22.31	2.3438	12 46 49.1	9.885	7	22 36 39.26	2.2582	3 40 59.2	12.364
8	20 48 42.88	2.3418	12 36 53.5	9.967	8	22 38 54.72	2.2571	3 28 36.7	12.385
9	20 51 3.33	2.3398	12 26 53.1	10.047	9	22 41 10.11	2.2559	3 16 13.0	12.403
10	20 53 23.66	2.3378	12 16 47.9	10.125	10	22 43 25.43	2.2548	3 3 48.3	12.420
11	20 55 43.87	2.3357	12 6 38.1	10.202	11	22 45 40.69	2.2538	2 51 22.6	12.435
12	20 58 3.95	2.3337	11 56 23.7	10.278	12	22 47 55.89	2.2528	2 38 56.1	12.449
13	21 0 23.91	2.3317	11 46 4.8	10.353	13	22 50 11.03	2.2518	2 26 28.7	12.462
14	21 2 43.75	2.3296	11 35 41.3	10.428	14	22 52 26.11	2.2509	2 14 0.6	12.474
15	21 5 3.46	2.3275	11 25 13.4	10.501	15	22 54 41.14	2.2500	2 1 31.8	12.485
16	21 7 23.05	2.3255	11 14 41.2	10.572	16	22 56 56.11	2.2492	1 49 2.4	12.494
17	21 9 42.52	2.3235	11 4 4.8	10.642	17	22 59 11.04	2.2484	1 36 32.5	12.502
18	21 12 1.87	2.3215	10 53 24.2	10.712	18	23 1 25.92	2.2477	1 24 2.1	12.509
19	21 14 21.10	2.3194	10 42 39.5	10.779	19	23 3 40.76	2.2470	1 11 31.4	12.514
20	21 16 40.20	2.3173	10 31 50.7	10.846	20	23 5 55.56	2.2463	0 59 0.4	12.518
21	21 18 59.18	2.3153	10 20 58.0	10.911	21	23 8 10.32	2.2457	0 46 29.2	12.521
22	21 21 18.04	2.3133	10 10 1.4	10.975	22	23 10 25.04	2.2450	0 33 57.9	12.522
23	21 23 36.78	2.3113	9 59 1.0	11.038	23	23 12 39.72	2.2444	0 21 26.6	12.522
24	21 25 55.40	2.3093	S. 9 47 56.8	11.100	24	23 14 54.37	2.2440	S. 0 8 55.3	12.521

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 14 54.37	2.2440	S. 0 8 55.3	12.521
1	23 17 9.00	2.2436	N. 0 3 35.9	12.518
2	23 19 23.60	2.2431	0 16 6.9	12.515
3	23 21 38.17	2.2427	0 28 37.7	12.510
4	23 23 52.72	2.2424	0 41 8.1	12.503
5	23 26 7.26	2.2422	0 53 38.1	12.495
6	23 28 21.78	2.2419	1 6 7.5	12.486
7	23 30 36.28	2.2417	1 18 36.4	12.476
8	23 32 50.78	2.2416	1 31 4.6	12.464
9	23 35 5.27	2.2414	1 43 32.1	12.452
10	23 37 19.75	2.2413	1 55 58.8	12.438
11	23 39 34.23	2.2413	2 8 24.7	12.423
12	23 41 48.71	2.2413	2 20 49.6	12.407
13	23 44 3.19	2.2414	2 33 13.5	12.389
14	23 46 17.68	2.2416	2 45 36.3	12.370
15	23 48 32.18	2.2417	2 57 57.9	12.350
16	23 50 46.69	2.2419	3 10 18.3	12.328
17	23 53 1.21	2.2421	3 22 37.3	12.305
18	23 55 15.74	2.2423	3 34 54.9	12.282
19	23 57 30.29	2.2427	3 47 11.1	12.257
20	23 59 44.87	2.2432	3 59 25.7	12.230
21	0 1 59.47	2.2436	4 11 38.7	12.202
22	0 4 14.10	2.2441	4 23 50.0	12.174
23	0 6 28.76	2.2445	N. 4 35 59.6	12.144

SUNDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 8 43.44	2.2449	N. 4 48 7.3	12.112
1	0 10 58.15	2.2456	5 0 13.1	12.080
2	0 13 12.91	2.2463	5 12 16.9	12.047
3	0 15 27.71	2.2470	5 24 18.7	12.013
4	0 17 42.55	2.2477	5 36 18.4	11.977
5	0 19 57.43	2.2484	5 48 15.9	11.938
6	0 22 12.36	2.2492	6 0 11.0	11.899
7	0 24 27.33	2.2500	6 12 3.8	11.861
8	0 26 42.36	2.2509	6 23 54.3	11.821
9	0 28 57.44	2.2518	6 35 42.3	11.779
10	0 31 12.58	2.2527	6 47 27.8	11.736
11	0 33 27.77	2.2537	6 59 10.6	11.691
12	0 35 43.02	2.2547	7 10 50.7	11.646
13	0 37 58.33	2.2557	7 22 28.1	11.600
14	0 40 13.71	2.2569	7 34 2.7	11.552
15	0 42 29.16	2.2581	7 45 34.3	11.503
16	0 44 44.68	2.2592	7 57 3.0	11.453
17	0 47 0.27	2.2604	8 8 28.7	11.402
18	0 49 15.93	2.2617	8 19 51.2	11.349
19	0 51 31.67	2.2630	8 31 10.6	11.296
20	0 53 47.49	2.2642	8 42 26.8	11.242
21	0 56 3.38	2.2655	8 53 39.6	11.186
22	0 58 19.35	2.2669	9 4 49.1	11.130
23	1 0 35.41	2.2683	9 15 55.2	11.072
24	1 2 51.55	2.2697	N. 9 26 57.7	11.013

MONDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 2 51.55	2.2697	N. 9 26 57.7	11.013
1	1 5 7.78	2.2712	9 37 56.7	10.953
2	1 7 24.10	2.2727	9 48 52.1	10.892
3	1 9 40.50	2.2742	9 59 43.8	10.830
4	1 11 57.00	2.2757	10 10 31.7	10.767
5	1 14 13.59	2.2773	10 21 15.8	10.702
6	1 16 30.28	2.2790	10 31 56.0	10.637
7	1 18 47.07	2.2806	10 42 32.2	10.570
8	1 21 3.95	2.2822	10 53 4.4	10.503
9	1 23 20.93	2.2838	11 3 32.6	10.435
10	1 25 38.01	2.2855	11 13 56.6	10.365
11	1 27 55.19	2.2872	11 24 16.4	10.295
12	1 30 12.48	2.2890	11 34 32.0	10.223
13	1 32 29.87	2.2907	11 44 43.2	10.150
14	1 34 47.37	2.2925	11 54 50.0	10.077
15	1 37 4.97	2.2943	12 4 52.4	10.002
16	1 39 22.68	2.2961	12 14 50.3	9.927
17	1 41 40.50	2.2978	12 24 43.6	9.850
18	1 43 58.42	2.2997	12 34 32.3	9.772
19	1 46 16.46	2.3016	12 44 16.3	9.694
20	1 48 34.61	2.3034	12 53 55.6	9.614
21	1 50 52.87	2.3052	13 3 30.0	9.533
22	1 53 11.24	2.3071	13 12 59.5	9.452
23	1 55 29.72	2.3090	N.13 22 24.2	9.370

TUESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 57 48.32	2.3109	N.13 31 43.9	9.286
1	2 0 7.03	2.3128	13 40 58.5	9.202
2	2 2 25.85	2.3147	13 50 8.1	9.117
3	2 4 44.79	2.3166	13 59 12.5	9.030
4	2 7 3.84	2.3185	14 8 11.7	8.942
5	2 9 23.01	2.3205	14 17 5.6	8.855
6	2 11 42.30	2.3224	14 25 54.3	8.767
7	2 14 1.70	2.3243	14 34 37.6	8.676
8	2 16 21.21	2.3262	14 43 15.4	8.585
9	2 18 40.84	2.3281	14 51 47.8	8.494
10	2 21 0.58	2.3299	15 0 14.7	8.402
11	2 23 20.43	2.3318	15 8 36.0	8.308
12	2 25 40.40	2.3337	15 16 51.7	8.214
13	2 28 0.48	2.3356	15 25 1.7	8.118
14	2 30 20.67	2.3375	15 33 5.9	8.023
15	2 32 40.98	2.3394	15 41 4.4	7.927
16	2 35 1.40	2.3412	15 48 57.1	7.829
17	2 37 21.93	2.3431	15 56 43.9	7.731
18	2 39 42.57	2.3449	16 4 24.8	7.632
19	2 42 3.32	2.3467	16 11 59.7	7.532
20	2 44 24.18	2.3486	16 19 28.6	7.432
21	2 46 45.15	2.3504	16 26 51.5	7.330
22	2 49 6.23	2.3522	16 34 8.2	7.227
23	2 51 27.41	2.3538	16 41 18.8	7.125
24	2 53 48.69	2.3555	N.16 48 23.2	7.022

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 53 48.69	2.3555	N.16 48 23.2	7.022	0	4 48 10.37	2.3907	N.20 15 25.2	1.459
1	2 56 10.07	2.3572	16 55 21.4	6.918	1	4 50 33.80	2.3901	20 16 49.1	1.337
2	2 58 31.56	2.3590	17 2 13.3	6.812	2	4 52 57.18	2.3893	20 18 5.6	1.214
3	3 0 53.15	2.3606	17 8 58.8	6.705	3	4 55 20.52	2.3886	20 19 14.8	1.093
4	3 3 14.83	2.3622	17 15 37.9	6.599	4	4 57 43.81	2.3877	20 20 16.7	0.971
5	3 5 36.61	2.3638	17 22 10.7	6.493	5	5 0 7.05	2.3868	20 21 11.3	0.848
6	3 7 58.49	2.3654	17 28 37.1	6.386	6	5 2 30.23	2.3859	20 21 58.5	0.727
7	3 10 20.46	2.3669	17 34 57.0	6.277	7	5 4 53.36	2.3849	20 22 38.5	0.606
8	3 12 42.52	2.3684	17 41 10.3	6.167	8	5 7 16.42	2.3838	20 23 11.2	0.484
9	3 15 4.67	2.3699	17 47 17.1	6.058	9	5 9 39.41	2.3826	20 23 36.6	0.363
10	3 17 26.91	2.3713	17 53 17.3	5.948	10	5 12 2.33	2.3813	20 23 54.7	0.242
11	3 19 49.23	2.3728	17 59 10.9	5.837	11	5 14 25.17	2.3801	20 24 5.6	+ 0.121
12	3 22 11.64	2.3742	18 4 57.8	5.726	12	5 16 47.94	2.3787	20 24 9.2	0.000
13	3 24 34.13	2.3754	18 10 38.0	5.614	13	5 19 10.62	2.3772	20 24 5.6	− 0.121
14	3 26 56.69	2.3767	18 16 11.5	5.502	14	5 21 33.21	2.3758	20 23 54.7	0.242
15	3 29 19.33	2.3779	18 21 38.2	5.388	15	5 23 55.72	2.3743	20 23 36.6	0.362
16	3 31 42.04	2.3792	18 26 58.1	5.275	16	5 26 18.13	2.3727	20 23 11.3	0.481
17	3 34 4.83	2.3804	18 32 11.2	5.162	17	5 28 40.44	2.3710	20 22 38.9	0.600
18	3 36 27.69	2.3815	18 37 17.5	5.047	18	5 31 2.65	2.3692	20 21 59.3	0.719
19	3 38 50.61	2.3825	18 42 16.9	4.932	19	5 33 24.75	2.3674	20 21 12.6	0.838
20	3 41 13.59	2.3836	18 47 9.3	4.816	20	5 35 46.74	2.3656	20 20 18.7	0.957
21	3 43 36.64	2.3847	18 51 54.8	4.700	21	5 38 8.62	2.3637	20 19 17.7	1.075
22	3 45 59.75	2.3856	18 56 33.3	4.583	22	5 40 30.38	2.3616	20 18 9.7	1.193
23	3 48 22.91	2.3864	N.19 1 4.8	4.467	23	5 42 52.01	2.3595	N.20 16 54.6	1.311
	THURSDAY 18.					SATURDAY 20.			
0	3 50 46.12	2.3872	N.19 5 29.4	4.351	0	5 45 13.52	2.3574	N.20 15 32.4	1.428
1	3 53 9.38	2.3881	19 9 46.9	4.233	1	5 47 34.90	2.3552	20 14 3.2	1.544
2	3 55 32.69	2.3888	19 13 57.3	4.115	2	5 49 56.15	2.3530	20 12 27.1	1.660
3	3 57 56.04	2.3895	19 18 0.7	3.997	3	5 52 17.26	2.3507	20 10 44.0	1.777
4	4 0 19.43	2.3902	19 21 56.9	3.878	4	5 54 38.23	2.3483	20 8 53.9	1.893
5	4 2 42.86	2.3907	19 25 46.0	3.759	5	5 56 59.06	2.3159	20 6 56.9	2.007
6	4 5 6.32	2.3912	19 29 28.0	3.640	6	5 59 19.74	2.3434	20 4 53.1	2.121
7	4 7 29.81	2.3917	19 33 2.8	3.520	7	6 1 40.27	2.3408	20 2 42.4	2.235
8	4 9 53.33	2.3922	19 36 30.4	3.400	8	6 4 0.64	2.3382	20 0 24.9	2.349
9	4 12 16.87	2.3925	19 39 50.8	3.280	9	6 6 20.86	2.3356	19 58 0.5	2.462
10	4 14 40.43	2.3928	19 43 4.0	3.160	10	6 8 40.92	2.3329	19 55 29.4	2.574
11	4 17 4.01	2.3031	19 46 10.0	3.039	11	6 11 0.81	2.3302	19 52 51.6	2.685
12	4 19 27.60	2.3933	19 49 8.7	2.918	12	6 13 20.54	2.3274	19 50 7.2	2.796
13	4 21 51.20	2.3934	19 52 0.2	2.797	13	6 15 40.10	2.3245	19 47 16.1	2.907
14	4 24 14.81	2.3935	19 54 44.4	2.676	14	6 17 59.48	2.3216	19 44 18.4	3.017
15	4 26 38.42	2.3935	19 57 21.3	2.554	15	6 20 18.69	2.3187	19 41 14.0	3.127
16	4 29 2.03	2.3334	19 59 50.9	2.433	16	6 22 37.72	2.3156	19 38 3.1	3.236
17	4 31 25.63	2.3933	20 2 13.3	2.312	17	6 24 56.56	2.3125	19 34 45.7	3.344
18	4 33 49.22	2.3931	20 4 28.4	2.191	18	6 27 15.22	2.3094	19 31 21.8	3.452
19	4 36 12.80	2.3928	20 6 36.2	2.068	19	6 29 33.69	2.3062	19 27 51.5	3.558
20	4 38 36.36	2.3925	20 8 36.6	1.946	20	6 31 51.97	2.3031	19 24 14.8	3.665
21	4 40 59.90	2.3922	20 10 29.7	1.824	21	6 34 10.06	2.2998	19 20 31.7	3.771
22	4 43 23.42	2.3917	20 12 15.5	1.702	22	6 36 27.95	2.2965	19 16 42.3	3.876
23	4 45 46.91	2.3912	20 13 54.0	1.581	23	6 38 45.64	2.2932	19 12 46.6	3.980
24	4 48 10.37	2.3907	N.20 15 25.2	1.459	24	6 41 3.13	2.2898	N.19 8 44.7	4.083

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 41 3.13	2.2898	N.19 8 44.7	4.083
1	6 43 20.42	2.2864	19 4 36.6	4.187
2	6 45 37.50	2.2829	19 0 22.3	4.289
3	6 47 54.37	2.2794	18 56 1.9	4.390
4	6 50 11.03	2.2759	18 51 35.5	4.490
5	6 52 27.48	2.2723	18 47 3.1	4.591
6	6 54 43.71	2.2687	18 42 24.6	4.691
7	6 56 59.72	2.2651	18 37 40.2	4.789
8	6 59 15.52	2.2615	18 32 50.0	4.886
9	7 1 31.10	2.2578	18 27 53.9	4.982
10	7 3 46.45	2.2540	18 22 52.1	5.078
11	7 6 1.58	2.2503	18 17 44.5	5.174
12	7 8 16.49	2.2466	18 12 31.2	5.268
13	7 10 31.17	2.2427	18 7 12.3	5.362
14	7 12 45.62	2.2388	18 1 47.8	5.455
15	7 14 59.83	2.2349	17 56 17.7	5.547
16	7 17 13.81	2.2311	17 50 42.2	5.638
17	7 19 27.56	2.2272	17 45 1.2	5.728
18	7 21 41.07	2.2232	17 39 14.8	5.817
19	7 23 54.35	2.2193	17 33 23.1	5.906
20	7 26 7.39	2.2153	17 27 26.1	5.994
21	7 28 20.19	2.2113	17 21 23.8	6.081
22	7 30 32.75	2.2073	17 15 16.4	6.166
23	7 32 45.07	2.2034	N.17 9 3.9	6.252

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 34 57.16	2.1994	N.17 2 46.2	6.337
1	7 37 9.00	2.1953	16 56 23.5	6.419
2	7 39 20.60	2.1912	16 49 55.9	6.501
3	7 41 31.95	2.1872	16 43 23.4	6.582
4	7 43 43.06	2.1831	16 36 46.0	6.663
5	7 45 53.92	2.1790	16 30 3.8	6.743
6	7 48 4.54	2.1749	16 23 16.8	6.822
7	7 50 14.91	2.1708	16 16 25.1	6.901
8	7 52 25.04	2.1667	16 9 28.7	6.977
9	7 54 34.92	2.1626	16 2 27.8	7.053
10	7 56 44.55	2.1585	15 55 22.3	7.129
11	7 58 53.94	2.1544	15 48 12.3	7.203
12	8 1 3.08	2.1503	15 40 57.9	7.277
13	8 3 11.97	2.1462	15 33 39.1	7.350
14	8 5 20.62	2.1421	15 26 15.9	7.422
15	8 7 29.02	2.1380	15 18 48.5	7.492
16	8 9 37.18	2.1339	15 11 16.9	7.562
17	8 11 45.09	2.1298	15 3 41.1	7.631
18	8 13 52.76	2.1257	14 56 1.2	7.699
19	8 16 0.18	2.1217	14 48 17.3	7.766
20	8 18 7.36	2.1177	14 40 29.3	7.832
21	8 20 14.30	2.1136	14 32 37.4	7.897
22	8 22 20.99	2.1095	14 24 41.6	7.962
23	8 24 27.44	2.1054	14 16 42.0	8.025
24	8 26 33.64	2.1013	N.14 8 38.6	8.087

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 26 33.64	2.1013	N.14 8 38.6	8.087
1	8 28 39.60	2.0974	14 0 31.5	8.149
2	8 30 45.33	2.0934	13 52 20.7	8.210
3	8 32 50.81	2.0893	13 44 6.3	8.270
4	8 34 56.05	2.0854	13 35 48.3	8.329
5	8 37 1.06	2.0815	13 27 26.8	8.387
6	8 39 5.83	2.0775	13 19 1.8	8.445
7	8 41 10.36	2.0736	13 10 33.4	8.501
8	8 43 14.66	2.0697	13 2 1.7	8.556
9	8 45 18.73	2.0659	12 53 26.7	8.611
10	8 47 22.57	2.0620	12 44 48.4	8.664
11	8 49 26.17	2.0581	12 36 7.0	8.716
12	8 51 29.54	2.0543	12 27 22.5	8.768
13	8 53 32.68	2.0505	12 18 34.9	8.819
14	8 55 35.60	2.0467	12 9 44.2	8.869
15	8 57 38.29	2.0429	12 0 50.6	8.918
16	8 59 40.75	2.0392	11 51 54.1	8.966
17	9 1 42.99	2.0355	11 42 54.7	9.014
18	9 3 45.01	2.0318	11 33 52.4	9.061
19	9 5 46.81	2.0282	11 24 47.4	9.106
20	9 7 48.39	2.0245	11 15 39.7	9.150
21	9 9 49.75	2.0209	11 6 29.4	9.193
22	9 11 50.90	2.0174	10 57 16.5	9.237
23	9 13 51.84	2.0138	N.10 48 1.0	9.280

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 15 52.56	2.0102	N.10 38 42.9	9.322
1	9 17 53.07	2.0068	10 29 22.4	9.361
2	9 19 53.38	2.0034	10 19 59.6	9.400
3	9 21 53.48	2.0000	10 10 34.4	9.439
4	9 23 53.38	1.9967	10 1 6.9	9.477
5	9 25 53.08	1.9933	9 51 37.2	9.514
6	9 27 52.57	1.9899	9 42 5.2	9.551
7	9 29 51.87	1.9866	9 32 31.0	9.587
8	9 31 50.97	1.9833	9 22 54.8	9.620
9	9 33 49.87	1.9801	9 13 16.6	9.653
10	9 35 48.58	1.9770	9 3 36.4	9.686
11	9 37 47.11	1.9739	8 53 54.2	9.719
12	9 39 45.45	1.9708	8 44 10.1	9.751
13	9 41 43.60	1.9677	8 34 24.1	9.781
14	9 43 41.57	1.9647	8 24 36.4	9.810
15	9 45 39.36	1.9617	8 14 46.9	9.840
16	9 47 36.97	1.9587	8 4 55.6	9.868
17	9 49 34.41	1.9558	7 55 2.7	9.895
18	9 51 31.67	1.9529	7 45 8.2	9.922
19	9 53 28.76	1.9501	7 35 12.1	9.947
20	9 55 25.68	1.9473	7 25 14.5	9.972
21	9 57 22.44	1.9446	7 15 15.4	9.997
22	9 59 19.03	1.9418	7 5 14.9	10.020
23	10 1 15.46	1.9391	6 55 13.0	10.042
24	10 3 11.72	1.9364	N. 6 45 9.8	10.064

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 25.					**SATURDAY 27.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 3 11.72	1.9364	N. 6 45 9.8	10.064	0	11 33 56.54	1.8626	S. 1 29 49.7	10.307
1	10 5 7.83	1.9338	6 35 5.3	10.086	1	11 35 48.28	1.8622	1 40 7.8	10.297
2	10 7 3.78	1.9312	6 24 59.5	10.107	2	11 37 40.00	1.8618	1 50 25.3	10.286
3	10 8 59.58	1.9287	6 14 52.5	10.126	3	11 39 31.69	1.8614	2 0 42.1	10.274
4	10 10 55.23	1.9263	6 4 44.4	10.144	4	11 41 23.37	1.8613	2 10 58.2	10.262
5	10 12 50.74	1.9239	5 54 35.2	10.163	5	11 43 15.04	1.8612	2 21 13.5	10.249
6	10 14 46.10	1.9215	5 44 24.8	10.181	6	11 45 6.71	1.8611	2 31 28.1	10.236
7	10 16 41.32	1.9192	5 34 13.4	10.197	7	11 46 58.37	1.8609	2 41 41.8	10.222
8	10 18 36.40	1.9168	5 24 1.1	10.213	8	11 48 50.02	1.8608	2 51 54.7	10.207
9	10 20 31.34	1.9146	5 13 47.8	10.229	9	11 50 41.67	1.8608	3 2 6.7	10.192
10	10 22 26.15	1.9124	5 3 33.6	10.243	10	11 52 33.32	1.8609	3 12 17.8	10.177
11	10 24 20.83	1.9102	4 53 18.6	10.257	11	11 54 24.98	1.8611	3 22 27.9	10.161
12	10 26 15.37	1.9080	4 43 2.7	10.271	12	11 56 16.65	1.8612	3 32 37.1	10.144
13	10 28 9.79	1.9060	4 32 46.1	10.283	13	11 58 8.33	1.8614	3 42 45.2	10.127
14	10 30 4.09	1.9039	4 22 28.8	10.295	14	12 0 0.02	1.8617	3 52 52.3	10.109
15	10 31 58.26	1.9019	4 12 10.7	10.307	15	12 1 51.73	1.8620	4 2 58.3	10.091
16	10 33 52.32	1.9000	4 1 52.0	10.317	16	12 3 43.46	1.8623	4 13 3.2	10.072
17	10 35 46.26	1.8981	3 51 32.7	10.326	17	12 5 35.21	1.8627	4 23 6.9	10.052
18	10 37 40.09	1.8962	3 41 12.9	10.335	18	12 7 26.99	1.8632	4 33 9.4	10.032
19	10 39 33.81	1.8944	3 30 52.5	10.343	19	12 9 18.79	1.8637	4 43 10.7	10.012
20	10 41 27.42	1.8927	3 20 31.7	10.351	20	12 11 10.63	1.8642	4 53 10.8	9.991
21	10 43 20.93	1.8910	3 10 10.4	10.358	21	12 13 2.50	1.8648	5 3 9.6	9.968
22	10 45 14.34	1.8893	2 59 48.7	10.365	22	12 14 54.41	1.8655	5 13 7.0	9.946
23	10 47 7.65	1.8877	N. 2 49 26.6	10.371	23	12 16 46.36	1.8662	S. 5 23 3.1	9.923
FRIDAY 26.					**SUNDAY 28.**				
0	10 49 0.86	1.8861	N. 2 39 4.2	10.376	0	12 18 38.35	1.8669	S. 5 32 57.8	9.900
1	10 50 53.98	1.8846	2 28 41.5	10.380	1	12 20 30.38	1.8677	5 42 51.1	9.876
2	10 52 47.01	1.8831	2 18 18.6	10.383	2	12 22 22.47	1.8686	5 52 42.9	9.851
3	10 54 39.95	1.8817	2 7 55.5	10.386	3	12 24 14.61	1.8695	6 2 33.2	9.826
4	10 56 32.81	1.8803	1 57 32.3	10.388	4	12 26 6.81	1.8704	6 12 22.0	9.800
5	10 58 25.59	1.8789	1 47 8.9	10.391	5	12 27 59.06	1.8713	6 22 9.2	9.774
6	11 0 18.28	1.8776	1 36 45.4	10.392	6	12 29 51.37	1.8724	6 31 54.9	9.747
7	11 2 10.90	1.8764	1 26 21.8	10.392	7	12 31 43.75	1.8735	6 41 38.9	9.720
8	11 4 3.45	1.8752	1 15 58.3	10.392	8	12 33 36.19	1.8746	6 51 21.3	9.692
9	11 5 55.92	1.8740	1 5 34.8	10.392	9	12 35 28.70	1.8757	7 1 2.0	9.664
10	11 7 48.33	1.8729	0 55 11.3	10.390	10	12 37 21.28	1.8770	7 10 41.0	9.635
11	11 9 40.67	1.8718	0 44 48.0	10.387	11	12 39 13.94	1.8783	7 20 18.2	9.606
12	11 11 32.95	1.8708	0 34 24.8	10.385	12	12 41 6.68	1.8797	7 29 53.7	9.576
13	11 13 25.17	1.8699	0 24 1.8	10.382	13	12 42 59.50	1.8810	7 39 27.3	9.544
14	11 15 17.34	1.8690	0 13 39.0	10.378	14	12 44 52.40	1.8823	7 48 59.0	9.513
15	11 17 9.45	1.8681	N. 0 3 16.4	10.374	15	12 46 45.38	1.8837	7 58 28.9	9.482
16	11 19 1.51	1.8672	S. 0 7 5.9	10.369	16	12 48 38.45	1.8853	8 7 56.9	9.450
17	11 20 53.52	1.8665	0 17 27.9	10.363	17	12 50 31.62	1.8869	8 17 22.9	9.417
18	11 22 45.49	1.8658	0 27 49.5	10.357	18	12 52 24.88	1.8885	8 26 46.9	9.383
19	11 24 37.42	1.8652	0 38 10.7	10.350	19	12 54 18.24	1.8902	8 36 8.9	9.349
20	11 26 29.31	1.8645	0 48 31.5	10.342	20	12 56 11.70	1.8918	8 45 28.8	9.315
21	11 28 21.16	1.8639	0 58 51.8	10.334	21	12 58 5.26	1.8936	8 54 46.7	9.280
22	11 30 12.98	1.8634	1 9 11.6	10.326	22	12 59 58.93	1.8953	9 4 2.4	9.244
23	11 32 4.77	1.8630	1 19 30.9	10.317	23	13 1 52.70	1.8971	9 13 16.0	9.208
24	11 33 56.54	1.8626	S. 1 29 49.7	10.307	24	13 3 46.58	1.8990	S. 9 22 27.4	9.172

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	13 3 46.58	1.8990	S. 9 22 27.4	9.172
1	13 5 40.58	1.9010	9 31 36.6	9.134
2	13 7 34.70	1.9029	9 40 43.5	9.096
3	13 9 28.93	1.9048	9 49 48.1	9.057
4	13 11 23.28	1.9069	9 58 50.4	9.018
5	13 13 17.76	1.9091	10 7 50.3	8.979
6	13 15 12.37	1.9112	10 16 47.9	8.939
7	13 17 7.11	1.9134	10 25 43.0	8.898
8	13 19 1.98	1.9156	10 34 35.7	8.857
9	13 20 56.98	1.9178	10 43 25.9	8.815
10	13 22 52.12	1.9202	10 52 13.5	8.773
11	13 24 47.40	1.9225	11 0 58.6	8.730
12	13 26 42.82	1.9249	11 9 41.1	8.686
13	13 28 38.39	1.9274	11 18 20.9	8.642
14	13 30 34.11	1.9298	11 26 58.1	8.597
15	13 32 29.97	1.9323	11 35 32.6	8.552
16	13 34 25.99	1.9349	11 44 4.4	8.506
17	13 36 22.16	1.9375	11 52 33.3	8.458
18	13 38 18.49	1.9402	12 0 59.4	8.411
19	13 40 14.98	1.9429	12 9 22.6	8.363
20	13 42 11.64	1.9457	12 17 43.0	8.316
21	13 44 8.46	1.9484	12 26 0.5	8.267
22	13 46 5.45	1.9512	12 34 15.0	8.217
23	13 48 2.61	1.9540	S. 12 42 26.5	8.167

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	13 49 59.93	1.9568	S. 12 50 35.0	8.116
1	13 51 57.43	1.9598	12 58 40.4	8.064
2	13 53 55.11	1.9628	13 6 42.7	8.012
3	13 55 52.97	1.9658	13 14 41.9	7.960
4	13 57 51.01	1.9688	13 22 37.9	7.907
5	13 59 49.23	1.9719	13 30 30.7	7.852
6	14 1 47.64	1.9750	13 38 20.2	7.797
7	14 3 46.23	1.9781	13 46 6.4	7.742
8	14 5 45.01	1.9813	13 53 49.3	7.687
9	14 7 43.99	1.9846	14 1 28.9	7.632
10	14 9 43.16	1.9877	14 9 5.1	7.574
11	14 11 42.52	1.9910	14 16 37.8	7.516
12	14 13 42.08	1.9943	14 24 7.0	7.457
13	14 15 41.84	1.9977	14 31 32.7	7.399
14	14 17 41.80	2.0011	14 38 54.9	7.340
15	14 19 41.97	2.0045	14 46 13.5	7.280
16	14 21 42.34	2.0079	14 53 28.5	7.218
17	14 23 42.92	2.0113	15 0 39.7	7.156
18	14 25 43.70	2.0147	15 7 47.2	7.093
19	14 27 44.69	2.0183	15 14 50.9	7.031
20	14 29 45.90	2.0220	15 21 50.9	6.968
21	14 31 47.33	2.0256	15 28 47.1	6.904
22	14 33 48.97	2.0292	15 35 39.4	6.839
23	14 35 50.83	2.0328	15 42 27.8	6.774
24	14 37 52.91	2.0365	S. 15 49 12.3	6.708

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 37 52.91	2.0365	S. 15 49 12.3	6.708
1	14 39 55.21	2.0402	15 55 52.8	6.641
2	14 41 57.73	2.0438	16 2 29.2	6.573
3	14 44 0.47	2.0476	16 9 1.6	6.506
4	14 46 3.44	2.0513	16 15 29.9	6.437
5	14 48 6.63	2.0551	16 21 54.0	6.366
6	14 50 10.05	2.0589	16 28 13.8	6.295
7	14 52 13.70	2.0627	16 34 29.4	6.225
8	14 54 17.58	2.0666	16 40 40.8	6.154
9	14 56 21.69	2.0704	16 46 47.9	6.082
10	14 58 26.03	2.0743	16 52 50.6	6.008
11	15 0 30.61	2.0782	16 58 48.9	5.935
12	15 2 35.42	2.0822	17 4 42.8	5.861
13	15 4 40.47	2.0861	17 10 32.2	5.786
14	15 6 45.75	2.0900	17 16 17.1	5.710
15	15 8 51.27	2.0940	17 21 57.4	5.633
16	15 10 57.03	2.0980	17 27 33.1	5.556
17	15 13 3.03	2.1020	17 33 4.1	5.478
18	15 15 9.27	2.1061	17 38 30.4	5.399
19	15 17 15.76	2.1101	17 43 52.0	5.321
20	15 19 22.48	2.1140	17 49 8.9	5.242
21	15 21 29.44	2.1180	17 54 21.0	5.161
22	15 23 36.64	2.1221	17 59 28.2	5.079
23	15 25 44.09	2.1262	S. 18 4 30.5	4.997

THURSDAY, FEBRUARY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 27 51.78	2.1302	S. 18 9 27.8	4.914

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter. . . .	1	0	50.2
● New Moon	8	17	59.3
☽ First Quarter . . .	15	12	47.5
○ Full Moon	22	19	15.5
☾ Last Quarter. . . .	30	22	26.6

	d	h
☾ Perigee.	12	8.8
☾ Apogee.	28	6.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Pollux	W.	79° 16′ 46″	3156	80° 43′ 48″	3153	82° 10′ 54″	3148	83° 38′ 5″	3145
	Regulus	W.	42 20 27	3113	43 48 21	3109	45 16 20	3103	46 44 26	3096
	Antares	E.	57 35 8	3106	56 7 6	3105	54 39 2	3103	53 10 56	3101
	Sun	E.	90 22 33	3471	89 1 37	3469	87 40 38	3466	86 19 36	3462
2	Regulus	W.	54 6 41	3065	55 35 32	3058	57 4 33	3051	58 33 43	3043
	Antares	E.	45 49 43	3087	44 21 17	3083	42 52 47	3079	41 24 12	3075
	Sun	E.	79 33 9	3436	78 11 33	3429	76 49 49	3422	75 27 57	3414
3	Regulus	W.	66 2 15	2995	67 32 34	2985	69 3 6	2974	70 33 51	2964
	Antares	E.	34 0 8	3057	32 31 6	3055	31 2 1	3054	29 32 55	3053
	Sun	E.	68 36 13	3368	67 13 20	3357	65 50 14	3346	64 26 56	3336
4	Regulus	W.	78 11 12	2903	79 43 27	2890	81 15 59	2877	82 48 47	2863
	Spica	W.	24 14 38	2883	25 47 19	2870	27 20 17	2857	28 53 31	2843
	Sun	E.	57 27 5	3274	56 2 23	3261	54 37 26	3247	53 12 13	3233
5	Regulus	W.	90 37 15	2794	92 11 51	2779	93 46 46	2765	95 22 0	2750
	Spica	W.	36 44 9	2774	38 19 11	2759	39 54 33	2744	41 30 14	2730
	Sun	E.	46 2 0	3163	44 35 7	3148	43 7 56	3134	41 40 28	3119
6	Regulus	W.	103 23 6	2676	105 0 18	2661	106 37 50	2646	108 15 42	2632
	Spica	W.	49 33 36	2655	51 11 17	2640	52 49 18	2624	54 27 40	2610
	Sun	E.	34 18 49	3061	32 49 40	3038	31 20 15	3026	29 50 34	3014
10	Sun	W.	17 6 26	2731	18 42 24	2702	20 19 1	2678	21 56 10	2659
	α Arietis	E.	88 49 24	2319	87 3 53	2314	85 18 14	2309	83 32 27	2303
	Saturn	E.	103 8 14	2266	101 21 24	2259	99 34 24	2253	97 47 16	2248
11	Sun	W.	30 7 10	2600	31 46 5	2592	33 25 11	2585	35 4 26	2580
	α Arietis	E.	74 41 54	2286	72 55 34	2284	71 9 11	2283	69 22 47	2283
	Saturn	E.	88 49 48	2228	87 2 2	2224	85 14 11	2222	83 26 17	2220
	Aldebaran	E.	107 48 7	2240	106 0 39	2237	104 13 6	2234	102 25 29	2232
12	Sun	W.	43 22 8	2565	45 1 51	2564	46 41 35	2564	48 21 20	2563
	α Arietis	E.	60 30 51	2289	58 44 35	2292	56 58 24	2296	55 12 18	2300
	Saturn	E.	74 26 15	2216	72 38 12	2217	70 50 10	2218	69 2 10	2220
	Aldebaran	E.	93 26 51	2228	91 39 5	2228	89 51 19	2229	88 3 34	2230
	Jupiter	E.	108 0 22	2192	106 11 42	2192	104 23 3	2193	102 34 25	2194
13	Sun	W.	56 39 56	2569	58 19 33	2572	59 59 6	2575	61 38 35	2578
	α Arietis	E.	46 23 46	2334	44 38 36	2344	42 53 40	2355	41 9 0	2367
	Saturn	E.	60 2 45	2231	58 15 3	2233	56 27 25	2237	54 39 52	2240
	Aldebaran	E.	79 5 23	2240	77 17 55	2243	75 30 31	2246	73 43 12	2250
	Jupiter	E.	93 31 49	2204	91 43 27	2207	89 55 10	2210	88 6 58	2214
14	Sun	W.	69 54 48	2598	71 33 46	2603	73 12 37	2608	74 51 21	2613
	Fomalhaut	W.	39 39 20	3599	40 57 55	3511	42 18 7	3432	43 39 47	3363
	Saturn	E.	45 43 35	2262	43 56 40	2267	42 9 52	2272	40 23 12	2278
	Aldebaran	E.	64 48 5	2271	63 1 23	2276	61 14 49	2281	59 28 22	2287
	Jupiter	E.	79 7 22	2235	77 19 46	2239	75 32 17	2245	73 44 56	2249
15	Sun	W.	83 3 12	2641	84 41 11	2648	86 19 1	2654	87 56 43	2660

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Pollux	W.	85° 5′ 20″	3140	86° 32′ 41″	3136	88° 0′ 7″	3131	89° 27′ 39″	3125
	Regulus	W.	48 12 38	3092	49 40 57	3086	51 9 24	3080	52 37 58	3073
	Antares	E.	51 42 48	3099	50 14 37	3096	48 46 23	3093	47 18 5	3090
	Sun	E.	84 56 29	3458	83 37 18	3453	82 16 1	3447	80 54 38	3442
2	Regulus	W.	60 3 3	3034	61 32 34	3025	63 2 16	3015	64 32 9	3005
	Antares	E.	39 55 32	3072	38 26 48	3068	36 57 59	3064	35 29 6	3060
	Sun	E.	74 5 56	3405	72 43 45	3397	71 21 25	3388	69 58 55	3378
3	Regulus	W.	72 4 49	2952	73 36 2	2940	75 7 30	2928	76 39 13	2915
	Antares	E.	28 3 48	3053	26 34 41	3056	25 5 37	3061	23 36 39	3069
	Sun	E.	63 3 26	3324	61 39 42	3312	60 15 44	3300	58 51 32	3287
4	Regulus	W.	84 21 53	2849	85 55 17	2836	87 28 58	2822	89 2 57	2808
	Spica	W.	30 27 3	2829	32 0 53	2816	33 35 0	2802	35 9 25	2788
	Sun	E.	51 46 43	3219	50 20 57	3206	48 54 55	3192	47 28 36	3177
5	Regulus	W.	96 57 34	2734	98 33 28	2720	100 9 41	2705	101 46 14	2691
	Spica	W.	43 6 14	2715	44 42 34	2700	46 19 14	2684	47 56 15	2669
	Sun	E.	40 12 42	3105	38 44 39	3091	37 16 19	3078	35 47 42	3064
6	Regulus	W.	109 53 54	2617	111 32 26	2603	113 11 17	2588	114 50 28	2574
	Spica	W.	56 6 22	2594	57 45 25	2580	59 24 48	2564	61 4 32	2550
	Sun	E.	28 20 38	3003	26 50 29	2994	25 20 9	2986	23 49 39	2980
10	Sun	W.	23 33 45	2643	25 11 41	2629	26 49 56	2618	28 28 26	2608
	α Arietis	E.	81 46 32	2298	80 0 30	2295	78 14 23	2291	76 28 11	2288
	Saturn	E.	96 0 0	2243	94 12 36	2239	92 25 6	2235	90 37 30	2231
11	Sun	W.	36 43 48	2576	38 23 16	2572	40 2 49	2569	41 42 27	2566
	α Arietis	E.	67 36 22	2283	65 49 57	2283	64 3 33	2285	62 17 11	2286
	Saturn	E.	81 38 20	2219	79 50 21	2218	78 2 20	2217	76 14 18	2216
	Aldebaran	E.	100 37 49	2230	98 50 6	2229	97 2 22	2229	95 14 37	2228
12	Sun	W.	50 1 6	2564	51 40 51	2564	53 20 35	2566	55 0 17	2568
	α Arietis	E.	53 26 18	2305	51 40 26	2311	49 54 42	2318	48 9 8	2326
	Saturn	E.	67 14 12	2221	65 26 16	2222	63 38 22	2225	61 50 32	2227
	Aldebaran	E.	86 15 51	2231	84 28 10	2233	82 40 31	2235	80 52 55	2237
	Jupiter	E.	100 45 49	2196	98 57 15	2197	97 8 43	2199	95 20 14	2202
13	Sun	W.	63 18 0	2582	64 57 20	2585	66 36 35	2590	68 15 44	2593
	α Arietis	E.	39 24 38	2380	37 40 35	2396	35 56 54	2413	34 13 38	2433
	Saturn	E.	52 52 24	2244	51 5 2	2249	49 17 47	2253	47 30 38	2257
	Aldebaran	E.	71 55 59	2253	70 8 51	2257	68 21 49	2262	66 34 54	2266
	Jupiter	E.	86 18 51	2217	84 30 49	2221	82 42 53	2226	80 55 4	2231
14	Sun	W.	76 29 58	2618	78 8 28	2624	79 46 50	2629	81 25 5	2635
	Fomalhaut	W.	45 2 46	3302	46 26 55	3248	47 52 7	3201	49 18 15	3159
	Saturn	E.	38 36 40	2284	36 50 17	2290	35 4 3	2296	33 17 58	2302
	Aldebaran	E.	57 42 3	2292	55 55 52	2298	54 9 50	2304	52 23 57	2311
	Jupiter	E.	71 57 42	2255	70 10 36	2260	68 23 38	2266	66 36 48	2271
15	Sun	W.	89 34 16	2667	91 11 40	2673	92 48 56	2680	94 26 3	2687

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
15	Fomalhaut	W.	50° 45′ 13″	3122	52° 12′ 56″	3089	53° 41′ 19″	3060	55° 10′ 17″	3034
	SATURN	E.	31 32 2	2309	29 46 16	2316	28 0 40	2324	26 15 15	2331
	Aldebaran	E.	50 38 13	2317	48 52 38	2324	47 7 13	2330	45 21 58	2337
	JUPITER	E.	64 50 6	2277	63 3 33	2283	61 17 9	2289	59 30 54	2295
	Pollux	E.	93 11 3	2385	91 27 7	2391	89 43 19	2396	87 59 39	2403
16	SUN	W.	96 3 0	2694	97 39 48	2701	99 16 27	2708	100 52 57	2715
	Fomalhaut	W.	62 41 53	2947	64 13 12	2936	65 44 45	2927	67 16 30	2919
	α Pegasi	W.	43 19 19	2680	44 56 26	2667	46 33 50	2656	48 11 29	2646
	Aldebaran	E.	36 38 20	2376	34 54 11	2384	33 10 14	2394	31 26 31	2404
	JUPITER	E.	50 41 55	2328	48 56 36	2335	47 11 27	2341	45 26 28	2348
	Pollux	E.	79 23 37	2437	77 40 55	2444	75 58 23	2451	74 16 1	2459
17	SUN	W.	108 53 1	2752	110 28 32	2759	112 3 54	2767	113 39 5	2775
	Fomalhaut	W.	74 57 9	2899	76 29 29	2899	78 1 49	2899	79 34 9	2901
	α Pegasi	W.	56 22 10	2623	58 0 34	2621	59 39 1	2620	61 17 29	2621
	JUPITER	E.	36 44 8	2385	35 0 12	2393	33 16 28	2401	31 32 55	2410
	Pollux	E.	65 47 9	2503	64 6 0	2513	62 25 5	2523	60 44 24	2533
	Regulus	E.	102 13 57	2421	100 30 53	2428	98 47 58	2434	97 5 12	2440
18	SUN	W.	121 32 27	2814	123 6 36	2823	124 40 34	2831	126 14 21	2840
	Fomalhaut	W.	87 15 1	2920	88 46 54	2926	90 18 40	2933	91 50 17	2942
	α Pegasi	W.	69 29 26	2630	71 7 40	2633	72 45 50	2637	74 23 54	2642
	α Arietis	W.	25 57 19	2716	27 33 24	2705	29 9 58	2689	30 46 56	2673
	Pollux	E.	52 24 47	2593	50 45 43	2607	49 6 57	2621	47 28 31	2637
	Regulus	E.	88 33 44	2475	86 51 56	2482	85 10 17	2489	83 28 48	2496
19	α Arietis	W.	38 55 4	2643	40 33 1	2641	42 11 0	2641	43 48 59	2643
	SATURN	W.	23 53 40	2527	25 34 15	2533	27 14 42	2540	28 55 0	2546
	Pollux	E.	39 22 7	2734	37 46 12	2759	36 10 50	2786	34 36 4	2816
	Regulus	E.	75 3 57	2533	73 23 20	2541	71 43 14	2549	70 3 9	2557
20	α Arietis	W.	51 58 15	2657	53 35 53	2661	55 13 25	2666	56 50 50	2672
	SATURN	W.	37 14 13	2580	38 53 35	2588	40 32 46	2596	42 11 46	2604
	Aldebaran	W.	18 27 41	2659	20 5 16	2654	21 42 57	2653	23 20 40	2653
	Regulus	E.	61 45 32	2599	60 6 36	2608	58 27 52	2617	56 49 20	2626
21	α Arietis	W.	64 55 58	2704	66 32 33	2711	68 8 59	2718	69 45 15	2725
	SATURN	W.	50 24 5	2645	52 1 59	2654	53 39 41	2662	55 17 12	2671
	Aldebaran	W.	31 28 37	2672	33 5 54	2678	34 43 4	2684	36 20 5	2691
	Regulus	E.	48 39 52	2675	47 2 39	2686	45 25 40	2697	43 48 56	2708
	Spica	E.	102 19 6	2640	100 41 5	2649	99 3 16	2657	97 25 39	2666
22	α Arietis	W.	77 43 59	2766	79 19 11	2775	80 54 11	2785	82 28 59	2793
	SATURN	W.	63 21 47	2716	64 58 6	2725	66 34 12	2734	68 10 6	2744
	Aldebaran	W.	44 22 44	2730	45 58 44	2738	47 34 34	2746	49 10 13	2755
	JUPITER	W.	30 41 20	2702	32 17 58	2710	33 54 25	2718	35 30 41	2727
	Regulus	E.	35 49 9	2771	34 14 3	2785	32 39 15	2800	31 4 47	2816
	Spica	E.	89 20 33	2712	87 44 9	2721	86 7 57	2730	84 31 57	2740
23	α Arietis	W.	90 20 2	2840	91 53 38	2850	93 27 1	2859	95 0 12	2869
	SATURN	W.	76 6 29	2791	77 41 8	2801	79 15 34	2811	80 49 48	2821
	Aldebaran	W.	57 5 32	2800	58 40 0	2808	60 14 17	2818	61 48 22	2827

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
15	Fomalhaut	W.	56° 39′ 47″	3012	58° 9′ 45″	2993	59° 40′ 7″	2975	61° 10′ 51″	2961
	SATURN	E.	24 30 1	2339	22 44 59	2349	21 0 11	2359	19 15 37	2370
	Aldebaran	E.	43 36 53	2344	41 51 58	2352	40 7 14	2360	38 22 41	2368
	JUPITER	E.	57 44 47	2301	55 58 49	2308	54 13 1	2315	52 27 23	2322
	Pollux	E.	86 16 8	2409	84 32 46	2415	82 49 33	2422	81 6 30	2419
16	SUN	W.	102 29 17	2722	104 5 28	2729	105 41 29	2737	107 17 20	2744
	Fomalhaut	W.	68 48 25	2912	70 20 28	2908	71 52 37	2904	73 24 51	2901
	α Pegasi	W.	49 49 21	2639	51 27 23	2633	53 5 33	2629	54 43 49	2625
	Aldebaran	E.	29 43 2	2414	27 59 48	2426	26 16 50	2438	24 34 9	2452
	JUPITER	E.	43 41 39	2355	41 57 0	2363	40 12 32	2371	38 28 15	2378
	Pollux	E.	72 33 50	2467	70 51 51	2477	69 10 5	2485	67 28 31	2494
17	SUN	W.	115 14 6	2782	116 48 57	2791	118 23 37	2798	119 58 7	2806
	Fomalhaut	W.	81 6 27	2903	82 38 42	2905	84 10 54	2909	85 43 1	2015
	α Pegasi	W.	62 55 56	2621	64 34 22	2623	66 12 46	2624	67 51 8	2627
	JUPITER	E.	29 49 34	2418	28 6 25	2427	26 23 29	2437	24 40 47	2448
	Pollux	E.	59 3 57	2544	57 23 45	2556	55 43 49	2567	54 4 9	2580
	Regulus	E.	95 22 35	2448	93 40 8	2454	91 57 50	2461	90 15 42	2468
18	SUN	W.	127 47 57	2849	129 21 21	2858	130 54 34	2866	132 27 36	2876
	Fomalhaut	W.	93 21 43	2950	94 52 58	2960	96 24 1	2970	97 54 52	2981
	α Pegasi	W.	76 1 52	2646	77 39 44	2652	79 17 29	2657	80 55 7	2663
	α Arietis	W.	32 24 12	2663	34 1 42	2655	35 39 22	2649	37 17 10	2645
	Pollux	E.	45 50 26	2654	44 12 44	2671	42 35 25	2690	40 58 32	2711
	Regulus	E.	81 47 29	2503	80 6 20	2511	78 25 22	2518	76 44 34	2526
19	α Arietis	W.	45 26 56	2644	47 4 51	2646	48 42 43	2649	50 20 31	2652
	SATURN	W.	30 35 9	2553	32 15 9	2559	33 55 0	2566	35 34 41	2573
	Pollux	E.	33 1 57	2851	31 28 35	2889	29 56 2	2932	28 24 24	2963
	Regulus	E.	68 23 15	2565	66 43 32	2573	65 4 0	2582	63 24 40	2590
20	α Arietis	W.	58 28 8	2678	60 5 18	2684	61 42 20	2690	63 19 13	2696
	SATURN	W.	43 50 36	2612	45 29 15	2620	47 7 43	2628	48 46 0	2637
	Aldebaran	W.	24 58 23	2654	26 36 4	2657	28 13 41	2662	29 51 12	2666
	Regulus	E.	55 11 0	2635	53 32 53	2645	51 54 59	2655	50 17 19	2665
21	α Arietis	W.	71 21 21	2733	72 57 17	2741	74 33 2	2750	76 8 36	2759
	SATURN	W.	56 54 31	2680	58 31 38	2689	60 8 33	2698	61 45 16	2707
	Aldebaran	W.	37 56 57	2698	39 33 39	2706	41 10 11	2714	42 46 33	2722
	Regulus	E.	42 12 27	2719	40 36 13	2731	39 0 15	2744	37 24 33	2757
	Spica	E.	95 48 14	2675	94 11 0	2683	92 33 58	2693	90 57 9	2703
22	α Arietis	W.	84 3 36	2803	85 38 0	2811	87 12 13	2821	88 46 14	2831
	SATURN	W.	69 45 48	2753	71 21 17	2763	72 56 34	2772	74 31 38	2782
	Aldebaran	W.	50 45 40	2763	52 20 56	2772	53 56 0	2782	55 30 52	2791
	JUPITER	W	37 6 45	2736	38 42 37	2744	40 18 18	2753	41 53 48	2761
	Regulus	E.	29 30 40	2834	27 56 56	2852	26 23 36	2873	24 50 42	2895
	Spica	E.	82 56 10	2749	81 20 35	2759	79 45 13	2766	78 10 3	2777
23	α Arietis	W.	96 33 10	2880	98 5 55	2889	99 38 28	2899	101 10 48	2909
	SATURN	W.	82 23 49	2830	83 57 38	2839	85 31 15	2849	87 4 39	2859
	Aldebaran	W.	63 22 15	2836	64 55 56	2846	66 29 24	2855	68 2 41	2864

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	**Jupiter**	W.	43° 29′ 7″	2770	45° 4′ 14″	2780	46° 39′ 8″	2789	48° 13′ 50″	2798
	Spica	E.	76 35 5	2787	75 0 20	2797	73 25 48	2806	71 51 28	2816
24	**Saturn**	W.	88 37 51	2868	90 10 51	2878	91 43 38	2887	93 16 13	2896
	Aldebaran	W.	69 35 46	2873	71 8 39	2882	72 41 21	2891	74 13 51	2901
	Jupiter	W.	56 4 19	2845	57 37 48	2854	59 11 6	2863	60 44 12	2873
	Pollux	W.	28 53 55	3228	30 19 31	3204	31 45 35	3186	33 12 1	3171
	Spica	E.	64 2 55	2863	62 29 49	2873	60 56 55	2882	59 24 13	2891
	Antares	E.	109 28 18	2893	107 55 50	2901	106 23 33	2911	104 51 28	2920
25	Aldebaran	W.	81 53 29	2945	83 24 51	2953	84 56 3	2961	86 27 4	2969
	Jupiter	W.	68 26 49	2916	69 58 47	2925	71 30 34	2934	73 2 10	2942
	Pollux	W.	40 27 34	3133	41 55 3	3130	43 22 36	3128	44 50 11	3128
	Spica	E.	51 43 37	2935	50 12 3	2944	48 40 40	2953	47 9 28	2961
	Antares	E.	97 13 48	2962	95 42 48	2971	94 11 59	2979	92 41 20	2988
	Venus	E.	110 22 53	3229	108 57 18	3238	107 31 54	3247	106 6 41	3257
26	Aldebaran	W.	93 59 42	3007	95 29 46	3014	96 59 41	3022	98 29 27	3027
	Jupiter	W.	80 37 41	2980	82 8 19	2987	83 38 48	2994	85 9 8	3000
	Pollux	W.	52 8 5	3132	53 35 36	3134	55 3 4	3136	56 30 30	3138
	Spica	E.	39 35 56	2999	38 5 42	3006	36 35 36	3012	35 5 38	3018
	Antares	E.	85 10 36	3026	83 40 55	3033	82 11 23	3040	80 42 0	3047
	Venus	E.	99 3 18	3300	97 39 7	3309	96 15 6	3317	94 51 14	3324
27	**Jupiter**	W.	92 38 58	3028	94 8 36	3033	95 38 8	3038	97 7 34	3042
	Pollux	W.	63 47 0	3150	65 14 9	3152	66 41 16	3153	68 8 21	3156
	Regulus	W.	26 44 59	3138	28 12 22	3134	29 39 50	3131	31 7 22	3128
	Antares	E.	73 17 0	3076	71 48 21	3061	70 19 48	3086	68 51 21	3091
	Venus	E.	87 53 54	3357	86 30 48	3362	85 7 48	3367	83 44 54	3372
	Sun	E.	132 31 19	3464	131 10 15	3468	129 49 15	3471	128 28 19	3475
28	Pollux	W.	75 23 13	3162	76 50 7	3162	78 17 1	3162	79 43 55	3162
	Regulus	W.	38 25 36	3121	39 53 20	3120	41 21 5	3119	42 48 52	3117
	Antares	E.	61 30 22	3108	60 2 22	3111	58 34 26	3114	57 6 33	3115
	Venus	E.	76 51 38	3390	75 29 10	3392	74 6 44	3394	72 44 21	3395
	Sun	E.	121 44 27	3486	120 23 47	3488	119 3 9	3488	117 42 32	3488
29	Pollux	W.	86 58 33	3158	88 25 33	3156	89 52 35	3153	91 19 40	3150
	Regulus	W.	50 8 21	3105	51 36 24	3102	53 4 31	3098	54 32 43	3095
	Antares	E.	49 47 36	3120	48 19 51	3121	46 52 7	3122	45 24 24	3122
	Venus	E.	65 52 36	3395	64 30 14	3393	63 7 50	3392	61 45 24	3389
	Sun	E.	110 59 20	3483	109 38 37	3481	108 17 52	3478	106 57 3	3474
30	Pollux	W.	98 36 7	3132	100 3 38	3126	101 31 16	3120	102 59 1	3114
	Regulus	W.	61 55 2	3069	63 23 50	3063	64 52 45	3056	66 21 49	3048
	Antares	E.	38 5 42	3119	36 37 55	3119	35 10 8	3119	33 42 21	3119
	Venus	E.	54 52 19	3369	53 29 27	3363	52 6 28	3357	50 43 22	3350
	Sun	E.	100 11 50	3450	98 50 30	3443	97 29 2	3437	96 7 27	3429
31	Regulus	W.	73 49 34	3005	75 19 40	2996	76 49 58	2985	78 20 29	2974
	Spica	W.	19 53 3	2984	21 23 36	2975	22 54 20	2965	24 25 16	2955
	Venus	E.	43 45 46	3309	42 21 45	3299	40 57 32	3289	39 33 8	3278
	Sun	E.	89 17 13	3385	87 54 39	3374	86 31 53	3363	85 8 54	3351

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	JUPITER	W.	49° 48′ 20″	2808	51° 22′ 38″	2817	52° 56′ 44″	2826	54° 30′ 38″	2836
	Spica	E.	70 17 21	2825	68 43 26	2835	67 9 43	2845	65 36 13	2854
24	SATURN	W.	94 48 37	2905	96 20 49	2915	97 52 49	2923	99 24 38	2933
	Aldebaran	W.	75 46 9	2909	77 18 16	2919	78 50 11	2927	80 21 55	2935
	JUPITER	W.	62 17 6	2881	63 49 49	2890	65 22 20	2899	66 54 40	2908
	Pollux	W.	34 38 45	3159	36 5 43	3150	37 32 52	3143	39 0 10	3138
	Spica	E.	57 51 43	2901	56 19 25	2909	54 47 18	2918	53 15 22	2927
	Antares	E.	103 19 34	2928	101 47 51	2937	100 16 19	2946	98 44 58	2954
25	Aldebaran	W.	87 57 55	2977	89 28 36	2985	90 59 7	2993	92 29 29	3000
	JUPITER	W.	74 33 36	2950	76 4 52	2957	77 35 58	2965	79 6 54	2973
	Pollux	W.	46 17 46	3128	47 45 22	3128	49 12 58	3129	50 40 32	3130
	Spica	E.	45 38 26	2969	44 7 34	2977	42 36 52	2984	41 6 19	2992
	Antares	E.	91 10 52	2996	89 40 34	3003	88 10 25	3011	86 40 26	3018
	VENUS	E.	104 41 39	3966	103 16 48	3976	101 52 8	3984	100 27 38	3993
26	Aldebaran	W.	99 59 6	3034	101 28 37	3039	102 58 1	3045	104 27 18	3051
	JUPITER	W.	86 39 21	3006	88 9 26	3012	89 39 24	3018	91 9 14	3023
	Pollux	W.	57 57 54	3140	59 25 15	3143	60 52 33	3145	62 19 48	3148
	Spica	E.	33 35 48	3025	32 6 6	3031	30 36 31	3036	29 7 3	3042
	Antares	E.	79 12 45	3053	77 43 38	3059	76 14 38	3065	74 45 46	3070
	VENUS	E.	93 27 30	3331	92 3 55	3338	90 40 27	3344	89 17 7	3351
27	JUPITER	W.	98 36 55	3045	100 6 12	3048	101 35 25	3051	103 4 34	3054
	Pollux	W.	69 35 23	3157	71 2 23	3159	72 29 21	3160	73 56 18	3162
	Regulus	W.	32 34 57	3127	34 2 34	3125	35 30 13	3124	36 57 54	3123
	Antares	E.	67 23 0	3095	65 54 44	3098	64 26 32	3102	62 58 25	3105
	VENUS	E.	82 22 6	3377	80 59 23	3380	79 36 44	3384	78 14 9	3387
	SUN	E.	127 7 27	3479	125 46 39	3480	124 25 53	3482	123 5 9	3484
28	Pollux	W.	81 10 49	3162	82 37 44	3162	84 4 39	3161	85 31 35	3159
	Regulus	W.	44 16 41	3115	45 44 32	3114	47 12 25	3111	48 40 21	3108
	Antares	E.	55 38 42	3117	54 10 53	3119	52 43 6	3120	51 15 21	3120
	VENUS	E.	71 21 59	3396	69 59 38	3397	68 37 18	3396	67 14 57	3396
	SUN	E.	116 21 55	3488	115 1 18	3488	113 40 40	3487	112 20 1	3485
29	Pollux	W.	92 46 49	3147	94 14 2	3143	95 41 19	3139	97 8 41	3130
	Regulus	W.	56 0 59	3091	57 29 20	3086	58 57 47	3080	60 26 21	3074
	Antares	E.	43 56 41	3121	42 28 57	3121	41 1 13	3120	39 33 28	3119
	VENUS	E.	60 22 55	3386	59 0 22	3383	57 37 46	3378	56 15 5	3374
	SUN	E.	105 36 10	3470	104 15 12	3466	102 54 10	3462	101 33 3	3456
30	Pollux	W.	104 26 53	3109	105 54 52	3103	107 22 58	3096	108 51 12	3089
	Regulus	W.	67 51 2	3041	69 20 24	3033	70 49 56	3024	72 19 39	3014
	Antares	E.	32 14 34	3119	30 46 48	3121	29 19 4	3124	27 51 24	3128
	VENUS	E.	49 20 8	3343	47 56 46	3336	46 33 16	3327	45 9 36	3319
	SUN	E.	94 45 43	3421	93 23 50	3413	92 1 48	3404	90 39 36	3394
31	Regulus	W.	79 51 14	2964	81 22 12	2952	82 53 25	2940	84 24 53	2927
	Spica	W.	25 56 25	2944	27 27 48	2932	28 59 26	2920	30 31 19	2909
	VENUS	E.	38 8 31	3267	36 43 41	3256	35 18 38	3243	33 53 20	3231
	SUN	E.	83 45 42	3339	82 22 16	3327	80 58 36	3315	79 34 42	3302

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	20 59 15.16	10.190	S. 17 6 22.4	+42.69	16 16.01	68.28	13 48.68	0.332
Frid.	2	21 3 19.32	10.157	16 49 8.7	43.43	16 15.85	68.16	13 56.26	0.299
Sat.	3	21 7 22.67	10.122	16 31 37.5	44.17	16 15.69	68.04	14 3.04	0.265
Sun.	4	21 11 25.21	10.089	16 13 48.9	+44.88	16 15.54	67.93	14 9.01	0.232
Mon.	5	21 15 26.95	10.055	15 55 43.5	45.58	16 15.37	67.81	14 14.17	0.198
Tues.	6	21 19 27.88	10.022	15 37 21.6	46.25	16 15.20	67.70	14 18.53	0.165
Wed.	7	21 23 28.00	9.988	15 18 43.8	+46.91	16 15.03	67.58	14 22.09	0.131
Thur.	8	21 27 27.32	9.955	14 59 50.5	47.54	16 14.86	67.46	14 24.85	0.098
Frid.	9	21 31 25.84	9.922	14 40 42.0	48.16	16 14.68	67.35	14 26.81	0.065
Sat.	10	21 35 23.56	9.889	14 21 18.9	+48.77	16 14.50	67.24	14 27.97	0.032
Sun.	11	21 39 20.48	9.856	14 1 41.6	49.35	16 14.32	67.13	14 28.35	0.001
Mon.	12	21 43 16.63	9.823	13 41 50.5	49.91	16 14.13	67.02	14 27.94	0.034
Tues.	13	21 47 12.00	9.790	13 21 46.0	+50.46	16 13.94	66.92	14 26.76	0.067
Wed.	14	21 51 6.59	9.758	13 1 28.6	50.98	16 13.75	66.81	14 24.81	0.098
Thur.	15	21 55 0.42	9.727	12 40 58.6	51.49	16 13.55	66.71	14 22.10	0.129
Frid.	16	21 58 53.51	9.696	12 20 16.5	+52.00	16 13.35	66.60	14 18.63	0.160
Sat.	17	22 2 45.86	9.666	11 59 22.8	52.48	16 13.15	66.50	14 14.44	0.190
Sun.	18	22 6 37.49	9.637	11 38 17.8	52.95	16 12.94	66.40	14 9.54	0.219
Mon.	19	22 10 28.42	9.608	11 17 1.8	+53.39	16 12.73	66.30	14 3.93	0.248
Tues.	20	22 14 18.67	9.580	10 55 35.3	53.82	16 12.53	66.20	13 57.64	0.276
Wed.	21	22 18 8.25	9.553	10 33 58.7	54.24	16 12.32	66.11	13 50.68	0.303
Thur.	22	22 21 57.18	9.527	10 12 12.3	+54.63	16 12.09	66.02	13 43.08	0.329
Frid.	23	22 25 45.48	9.500	9 50 16.5	55.01	16 11.86	65.93	13 34.84	0.356
Sat.	24	22 29 33.15	9.475	9 28 11.7	55.37	16 11.63	65.84	13 25.99	0.381
Sun.	25	22 33 20.24	9.451	9 5 58.4	+55.72	16 11.39	65.76	13 16.55	0.405
Mon.	26	22 37 6.76	9.428	8 43 36.9	56.06	16 11.15	65.68	13 6.54	0.428
Tues.	27	22 40 52.73	9.404	8 21 7.5	56.39	16 10.91	65.60	12 56.00	0.451
Wed.	28	22 44 38.17	9.383	7 58 30.8	56.68	16 10.66	65.52	12 44.93	0.473
Thur.	29	22 48 23.10	9.363	S. 7 35 47.0	+56.95	16 10.41	65.44	12 33.33	0.494

Note.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	20 59 12.82	10.189	S. 17 6 32.3	+42.68	13 48.61	0.332	20 45 24.21
Frid.	2	21 3 16.96	10.156	16 49 18.9	43.42	13 56.19	0.299	20 49 20.77
Sat.	3	21 7 20.30	10.122	16 31 47.9	44.16	14 2.98	0.265	20 53 17.32
Sun.	4	21 11 22.83	10.089	16 13 59.5	+44.87	14 8.95	0.232	20 57 13.88
Mon.	5	21 15 24.56	10.055	15 55 54.3	45.57	14 14.13	0.198	21 1 10.43
Tues.	6	21 19 25.49	10.022	15 37 32.6	46.24	14 18.50	0.165	21 5 6.99
Wed.	7	21 23 25.61	9.988	15 18 55.0	+46.90	14 22.07	0.131	21 9 3.54
Thur.	8	21 27 24.93	9.955	15 0 1.9	47.53	14 24.83	0.098	21 13 0.10
Frid.	9	21 31 23.45	9.922	14 40 53.6	48.15	14 26.80	0.065	21 16 56.65
Sat.	10	21 35 21.18	9.889	14 21 30.7	+48.76	14 27.97	0.032	21 20 53.21
Sun.	11	21 39 18.11	9.856	14 1 53.5	49.34	14 28.35	0.001	21 24 49.76
Mon.	12	21 43 14.27	9.823	13 42 2.6	49.90	14 27.95	0.034	21 28 46.32
Tues.	13	21 47 9.65	9.790	13 21 58.2	+50.46	14 26.78	0.067	21 32 42.87
Wed.	14	21 51 4.26	9.759	13 1 40.9	50.98	14 24.84	0.098	21 36 39.42
Thur.	15	21 54 58.10	9.728	12 41 11.0	51.49	14 22.13	0.129	21 40 35.97
Frid.	16	21 58 51.20	9.697	12 20 29.0	+52.00	14 18.67	0.160	21 44 32.53
Sat.	17	22 2 43.57	9.667	11 59 35.3	52.48	14 14.49	0.190	21 48 29.08
Sun.	18	22 6 35.22	9.638	11 38 30.3	52.95	14 9.59	0.219	21 52 25.63
Mon.	19	22 10 26.17	9.609	11 17 14.3	+53.39	14 3.99	0.248	21 56 22.18
Tues.	20	22 14 16.44	9.581	10 55 47.8	53.82	13 57.70	0.276	22 0 18.74
Wed.	21	22 18 6.04	9.554	10 34 11.2	54.24	13 50.75	0.303	22 4 15.29
Thur.	22	22 21 55.00	9.528	10 12 24.7	+54.63	13 43.15	0.329	22 8 11.85
Frid.	23	22 25 43.32	9.501	9 50 28.9	55.01	13 34.92	0.356	22 12 8.40
Sat.	24	22 29 31.02	9.476	9 28 24.1	55.37	13 26.07	0.381	22 16 4.95
Sun.	25	22 33 18.14	9.452	9 6 10.7	+55.73	13 16.64	0.405	22 20 1.50
Mon.	26	22 37 4.69	9.429	8 43 49.1	56.06	13 6.63	0.428	22 23 58.06
Tues.	27	22 40 50.70	9.405	8 21 19.6	56.39	12 56.09	0.451	22 27 54.61
Wed.	28	22 44 36.18	9.384	7 58 42.8	56.68	12 45.02	0.473	22 31 51.16
Thur.	29	22 48 21.14	9.363	S. 7 35 58.9	+56.96	12 33.43	0.494	22 35 47.71

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
$+ 9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	32	312 20 34.5	20 16.0	152.19	+ 0.45	9.9937192	+ 28.7	3 14 3.91
2	33	313 21 26.5	21 7.9	152.16	0.59	9.9937889	29.4	3 10 8.00
3	34	314 22 17.7	21 59.0	152.12	0.70	9.9938602	30.0	3 6 12.09
4	35	315 23 7.9	22 49.1	152.08	+ 0.80	9.9939329	+ 30.6	3 2 16.18
5	36	316 23 57.1	23 38.1	152.03	0.87	9.9940069	31.1	2 58 20.27
6	37	317 24 45.1	24 26.0	151.98	0.89	9.9940822	31.6	2 54 24.36
7	38	318 25 31.9	25 12.7	151.92	+ 0.90	9.9941587	+ 32.1	2 50 28.45
8	39	319 26 17.4	25 58.1	151.86	0.87	9.9942364	32.6	2 46 32.54
9	40	320 27 1.5	26 42.1	151.80	0.82	9.9943152	33.1	2 42 36.64
10	41	321 27 44.0	27 24.5	151.74	+ 0.75	9.9943951	+ 33.6	2 38 40.73
11	42	322 28 25.1	28 5.4	151.68	0.64	9.9944762	34.1	2 34 44.82
12	43	323 29 4.6	28 44.8	151.61	0.52	9.9945587	34.6	2 30 48.91
13	44	324 29 42.4	29 22.5	151.54	+ 0.39	9.9946426	+ 35.2	2 26 53.00
14	45	325 30 18.4	29 58.4	151.47	0.27	9.9947279	35.8	2 22 57.09
15	46	326 30 52.5	30 32.4	151.39	0.14	9.9948148	36.5	2 19 1.18
16	47	327 31 24.9	31 4.7	151.31	+ 0.01	9.9949032	+ 37.2	2 15 5.27
17	48	328 31 55.4	31 35.1	151.23	− 0.10	9.9949933	37.9	2 11 9.37
18	49	329 32 24.1	32 3.7	151.16	0.19	9.9950852	38.7	2 7 13.46
19	50	330 32 51.1	32 30.6	151.09	− 0.25	9.9951790	+ 39.5	2 3 17.56
20	51	331 33 16.4	32 55.8	151.02	0.27	9.9952747	40.3	1 59 21.65
21	52	332 33 39.9	33 19.2	150.94	0.27	9.9953723	41.1	1 55 25.75
22	53	333 34 1.6	33 40.8	150.87	− 0.22	9.9954719	+ 41.9	1 51 29.84
23	54	334 34 21.7	34 0.8	150.80	0.16	9.9955735	42.7	1 47 33.93
24	55	335 34 40.2	34 19.2	150.73	− 0.07	9.9956770	43.5	1 43 38.02
25	56	336 34 57.1	34 36.0	150.67	+ 0.03	9.9957822	+ 44.2	1 39 42.12
26	57	337 35 12.5	34 51.3	150.61	0.16	9.9958891	44.9	1 35 46.21
27	58	338 35 26.4	35 5.1	150.55	0.29	9.9959976	45.5	1 31 50.30
28	59	339 35 38.8	35 17.4	150.49	0.42	9.9961075	46.1	1 27 54.40
29	60	340 35 49.7	35 28.2	150.42	+ 0.55	9.9962187	+ 46.6	1 23 58.50

Note.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
$-9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 5.9	15 11.3	55 17.9	+ 1.55	55 37.6	+ 1.72	19 21.3	2.12	23.3
2	15 17.2	15 23.6	55 59.4	1.88	56 22.9	2.02	20 13.3	2.22	24.3
3	15 30.4	15 37.5	56 47.9	2.12	57 13.9	2.19	21 7.4	2.29	25.3
4	15 44.7	15 52.0	57 40.4	+ 2 22	58 7.0	+ 2.19	22 2.9	2.32	26.3
5	15 59.0	16 5.8	58 33.0	2.12	58 57.8	2.00	22 58.7	2.32	27.3
6	16 12.1	16 17.7	59 20.9	1.82	59 41.6	1.61	23 54.2	2.30	28.3
7	16 22.6	16 26.5	59 59.4	+ 1.35	60 13.9	+ 1.05	δ		29.3
8	16 29.5	16 31.3	60 24.7	0.73	60 31.6	+ 0.41	0 49.1	2.27	0.7
9	16 32.1	16 31.8	60 34.5	+ 0.08	60 33.4	− 0.24	1 43.2	2.24	1.7
10	16 30.6	16 28.3	60 28.7	− 0.54	60 20.5	− 0.80	2 37.0	2.24	2.7
11	16 25.3	16 21.8	60 9.4	1.04	59 55.6	1.23	3 30.8	2.25	3.7
12	16 17.5	16 12.5	59 39.8	1.38	59 22.4	1.50	4 25.1	2.28	4.7
13	16 7.4	16 2.2	59 3.8	− 1.57	58 44.5	− 1.62	5 20.1	2.30	5.7
14	15 56.8	15 51.5	58 24.9	1.63	58 5.3	1.62	6 15.4	2.31	6.7
15	15 46.2	15 41.1	57 45.9	1.60	57 26.9	1.56	7 10.7	2.29	7.7
16	15 36.0	15 31.2	57 8.5	− 1.50	56 50.8	− 1.44	8 5:1	2.23	8.7
17	15 26.6	15 22.2	56 33.9	1.38	56 17.7	1.32	8 57.8	2.15	9 7
18	15 18.0	15 14.0	56 2.3	1.25	55 47.7	1.18	9 48.3	2.05	10.7
19	15 10.3	15 6.7	55 33.9	− 1.12	55 20.9	− 1.05	10 36.5	1.96	11.7
20	15 3.4	15 0.3	55 8.7	0.98	54 57.3	0.92	11 22.5	1.87	12.7
21	14 57.4	14 54.8	54 46.7	0.84	54 37.0	0.77	12 6.4	1.81	13.7
22	14 52.4	14 50.4	54 28.3	− 0.68	54 20.7	− 0.59	12 49.4	1.77	14.7
23	14 48.6	14 47.1	54 14.1	0.49	54 8.9	0.38	13 31.6	1.75	15.7
24	14 46.1	14 45.5	54 5.0	− 0.26	54 2.7	− 0.12	14 13.7	1.77	16.7
25	14 45.3	14 45.6	54 2.0	+ 0.02	54 3.1	+ 0.17	14 56.4	1.80	17.7
26	14 46.4	14 47.8	54 6 2	0.35	54 11.4	0.52	15 40.3	1.86	18.7
27	14 49.8	14 52.4	54 18.7	0.71	54 28.3	0.90	16 25.9	1.94	19.7
28	14 55.7	14 59.6	54 40.3	1.10	54 54.6	1.29	17 13.4	2.03	20.7
29	15 4.1	15 9.3	55 11.3	+ 1.49	55 30.4	+ 1.68	18 3.1	2.11	21.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 27 51.78	2.1302	S. 18 9 27.8	4.914
1	15 29 59.71	2.1342	18 14 20.2	4.831
2	15 32 7.89	2.1383	18 19 7.6	4.747
3	15 34 16.31	2.1424	18 23 49.8	4.661
4	15 36 24.98	2.1465	18 28 26.9	4.576
5	15 38 33.89	2.1506	18 32 58.9	4.490
6	15 40 43.05	2.1547	18 37 25.7	4.403
7	15 42 52.45	2.1587	18 41 47.3	4.316
8	15 45 2.10	2.1628	18 46 3.6	4.227
9	15 47 11.99	2.1668	18 50 14.5	4.138
10	15 49 22.12	2.1709	18 54 20.1	4.048
11	15 51 32.50	2.1750	18 58 20.3	3.957
12	15 53 43.12	2.1790	19 2 15.0	3.866
13	15 55 53.98	2.1831	19 6 4.2	3.774
14	15 58 5.09	2.1872	19 9 47.9	3.682
15	16 0 16.44	2.1912	19 13 26.1	3.589
16	16 2 28.03	2.1952	19 16 58.6	3.495
17	16 4 39.87	2.1993	19 20 25.5	3.401
18	16 6 51.95	2.2033	19 23 46.7	3.305
19	16 9 4.27	2.2073	19 27 2.1	3.209
20	16 11 16.83	2.2112	19 30 11.8	3.113
21	16 13 29.62	2.2152	19 33 15.7	3.016
22	16 15 42.65	2.2192	19 36 13.7	2.918
23	16 17 55.92	2.2231	S. 19 39 5.8	2.819

FRIDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 20 9.42	2.2270	S. 19 41 52.0	2.720
1	16 22 23.16	2.2309	19 44 32.2	2.620
2	16 24 37.13	2.2348	19 47 6.4	2.519
3	16 26 51.33	2.2387	19 49 34.5	2.417
4	16 29 5.77	2.2425	19 51 56.5	2.316
5	16 31 20.43	2.2463	19 54 12.4	2.214
6	16 33 35.32	2.2501	19 56 22.2	2.112
7	16 35 50.44	2.2538	19 58 25.8	2.007
8	16 38 5.78	2.2576	20 0 23.1	1.902
9	16 40 21.35	2.2613	20 2 14.1	1.797
10	16 42 37.14	2.2650	20 3 58.8	1.692
11	16 44 53.15	2.2686	20 5 37.1	1.586
12	16 47 9.37	2.2722	20 7 9.1	1.479
13	16 49 25.81	2.2758	20 8 34.6	1.372
14	16 51 42.47	2.2794	20 9 53.7	1.264
15	16 53 59.34	2.2829	20 11 6.3	1.156
16	16 56 16.42	2.2864	20 12 12.4	1.047
17	16 58 33.71	2.2898	20 13 11.9	0.937
18	17 0 51.20	2.2932	20 14 4.8	0.827
19	17 3 8.90	2.2966	20 14 51.1	0.716
20	17 5 26.80	2.2999	20 15 30.7	0.605
21	17 7 44.89	2.3032	20 16 3.7	0.494
22	17 10 3.18	2.3065	20 16 30.0	0.382
23	17 12 21.67	2.3097	20 16 49.5	0.269
24	17 14 40.35	2.3129	S. 20 17 2.2	0.155

SATURDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 14 40.35	2.3129	S. 20 17 2.2	0.155
1	17 16 59.22	2.3160	20 17 8.1	− 0.042
2	17 19 18.27	2.3191	20 17 7.2	+ 0.072
3	17 21 37.51	2.3222	20 16 59.5	0.186
4	17 23 56.93	2.3252	20 16 44.9	0.302
5	17 26 16.53	2.3281	20 16 23.3	0.417
6	17 28 36.30	2.3310	20 15 54.8	0.533
7	17 30 56.25	2.3338	20 15 19.3	0.649
8	17 33 16.36	2.3366	20 14 36.9	0.765
9	17 35 36.64	2.3394	20 13 47.5	0.882
10	17 37 57.09	2.3421	20 12 51.0	1.000
11	17 40 17.69	2.3447	20 11 47.5	1.117
12	17 42 38.45	2.3473	20 10 37.0	1.234
13	17 44 59.37	2.3499	20 9 19.4	1.353
14	17 47 20.44	2.3524	20 7 54.6	1.472
15	17 49 41.66	2.3548	20 6 22.7	1.591
16	17 52 3.02	2.3572	20 4 43.7	1.710
17	17 54 24.52	2.3596	20 2 57.5	1.829
18	17 56 46.17	2.3619	20 1 4.2	1.948
19	17 59 7.95	2.3641	19 59 3.7	2.068
20	18 1 29.86	2.3662	19 56 56.0	2.189
21	18 3 51.90	2.3683	19 54 41.0	2.310
22	18 6 14.06	2.3703	19 52 18.8	2.430
23	18 8 36.34	2.3724	S. 19 49 49.4	2.550

SUNDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 10 58.75	2.3744	S. 19 47 12.8	2.671
1	18 13 21.27	2.3763	19 44 28.9	2.792
2	18 15 43.90	2.3781	19 41 37.8	2.913
3	18 18 6.64	2.3798	19 38 39.4	3.034
4	18 20 29.48	2.3815	19 35 33.7	3.155
5	18 22 52.42	2.3832	19 32 20.8	3.276
6	18 25 15.46	2.3848	19 29 0.6	3.397
7	18 27 38.60	2.3864	19 25 33.1	3.519
8	18 30 1.83	2.3878	19 21 58.3	3.640
9	18 32 25.14	2.3892	19 18 16.3	3.761
10	18 34 48.54	2.3906	19 14 27.0	3.882
11	18 37 12.02	2.3919	19 10 30.4	4.004
12	18 39 35.57	2.3932	19 6 26.5	4.125
13	18 41 59.20	2.3943	19 2 15.4	4.246
14	18 44 22.89	2.3954	18 57 57.0	4.367
15	18 46 46.65	2.3965	18 53 31.3	4.488
16	18 49 10.47	2.3975	18 48 58.4	4.608
17	18 51 34.35	2.3985	18 44 18.3	4.728
18	18 53 58.29	2.3994	18 39 31.0	4.849
19	18 56 22.28	2.4002	18 34 36.4	4.969
20	18 58 46.32	2.4010	18 29 34.7	5.088
21	19 1 10.40	2.4017	18 24 25.8	5.208
22	19 3 34.53	2.4024	18 19 9.7	5.328
23	19 5 58.69	2.4030	18 13 46.4	5.447
24	19 8 22.89	2.4036	S. 18 8 16.0	5.566

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 8 22.89	2.4036	S. 18 8 16.0	5.566
1	19 10 47.12	2.4041	18 2 38.5	5.684
2	19 13 11.38	2.4045	17 56 53.9	5.802
3	19 15 35.66	2.4049	17 51 2.2	5.920
4	19 17 59.97	2.4052	17 45 3.5	6.037
5	19 20 24.29	2.4055	17 38 57.8	6.153
6	19 22 48.63	2.4057	17 32 45.1	6.270
7	19 25 12.98	2.4059	17 26 25.4	6.386
8	19 27 37.34	2.4061	17 19 58.8	6.502
9	19 30 1.71	2.4062	17 13 25.2	6.617
10	19 32 26.09	2.4062	17 6 44.7	6.732
11	19 34 50.46	2.4062	16 59 57.4	6.845
12	19 37 14.83	2.4061	16 53 3.3	6.958
13	19 39 39.19	2.4060	16 46 2.4	7.071
14	19 42 3.55	2.4058	16 38 54.7	7.184
15	19 44 27.90	2.4057	16 31 40.3	7.296
16	19 46 52.23	2.4054	16 24 19.2	7.407
17	19 49 16.55	2.4051	16 16 51.5	7.517
18	19 51 40.85	2.4047	16 9 17.2	7.627
19	19 54 5.12	2.4043	16 1 36.3	7.736
20	19 56 29.37	2.4040	15 53 48.9	7.844
21	19 58 53.60	2.4036	15 45 55.0	7.952
22	20 1 17.80	2.4031	15 37 54.7	8.058
23	20 3 41.97	2.4025	S. 15 29 48.0	8.164

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 6 6.10	2.4019	S. 15 21 35.0	8.269
1	20 8 30.20	2.4013	15 13 15.7	8.373
2	20 10 54.26	2.4007	15 4 50.2	8.478
3	20 13 18.28	2.4000	14 56 18.4	8.582
4	20 15 42.26	2.3993	14 47 40.4	8.683
5	20 18 6.19	2.3985	14 38 56.4	8.783
6	20 20 30.08	2.3977	14 30 6.4	8.883
7	20 22 53.92	2.3969	14 21 10.4	8.983
8	20 25 17.71	2.3961	14 12 8.4	9.082
9	20 27 41.45	2.3952	14 3 0.6	9.179
10	20 30 5.14	2.3943	13 53 47.0	9.275
11	20 32 28.77	2.3934	13 44 27.6	9.370
12	20 34 52.35	2.3925	13 35 2.6	9.463
13	20 37 15.87	2.3915	13 25 32.0	9.557
14	20 39 39.33	2.3905	13 15 55.8	9.650
15	20 42 2.73	2.3895	13 6 14.0	9.742
16	20 44 26.07	2.3885	12 56 26.7	9.832
17	20 46 49.35	2.3874	12 46 34.1	9.921
18	20 49 12.56	2.3863	12 36 36.2	10.009
19	20 51 35.71	2.3852	12 26 33.0	10.096
20	20 53 58.79	2.3842	12 16 24.7	10.181
21	20 56 21.81	2.3831	12 6 11.3	10.266
22	20 58 44.76	2.3819	11 55 52.8	10.349
23	21 1 7.64	2.3807	11 45 29.4	10.431
24	21 3 30.45	2.3796	S. 11 35 1.1	10.512

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 3 30.45	2.3796	S. 11 35 1.1	10.512
1	21 5 53.19	2.3784	11 24 27.9	10.592
2	21 8 15.86	2.3772	11 13 50.0	10.671
3	21 10 38.46	2.3761	11 3 7.4	10.748
4	21 13 0.99	2.3749	10 52 20.2	10.824
5	21 15 23.45	2.3737	10 41 28.5	10.899
6	21 17 45.83	2.3724	10 30 32.3	10.973
7	21 20 8.14	2.3712	10 19 31.7	11.046
8	21 22 30.38	2.3700	10 8 26.8	11.116
9	21 24 52.54	2.3688	9 57 17.8	11.185
10	21 27 14.63	2.3676	9 46 4.6	11.254
11	21 29 36.65	2.3663	9 34 47.3	11.321
12	21 31 58.59	2.3651	9 23 26.1	11.386
13	21 34 20.46	2.3639	9 12 1.0	11.451
14	21 36 42.26	2.3627	9 0 32.0	11.514
15	21 39 3.98	2.3614	8 48 59.3	11.576
16	21 41 25.63	2.3602	8 37 22.9	11.637
17	21 43 47.21	2.3591	8 25 42.9	11.695
18	21 46 8.73	2.3580	8 13 59.5	11.752
19	21 48 30.17	2.3568	8 2 12.7	11.808
20	21 50 51.54	2.3556	7 50 22.5	11.863
21	21 53 12.84	2.3543	7 38 29.1	11.917
22	21 55 34.06	2.3532	7 26 32.5	11.968
23	21 57 55.22	2.3521	S. 7 14 32.9	12.017

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 0 16.31	2.3509	S. 7 2 30.4	12.066
1	22 2 37.33	2.3498	6 50 25.0	12.114
2	22 4 58.28	2.3487	6 38 16.7	12.161
3	22 7 19.17	2.3476	6 26 5.7	12.205
4	22 9 39.99	2.3465	6 13 52.1	12.248
5	22 12 0.75	2.3455	6 1 35.9	12.290
6	22 14 21.45	2.3444	5 49 17.3	12.330
7	22 16 42.08	2.3433	5 36 56.3	12.368
8	22 19 2.65	2.3423	5 24 33.1	12.405
9	22 21 23.16	2.3413	5 12 7.7	12.441
10	22 23 43.61	2.3403	4 59 40.2	12.475
11	22 26 4.00	2.3394	4 47 10.7	12.508
12	22 28 24.34	2.3385	4 34 39.2	12.540
13	22 30 44.62	2.3376	4 22 5.9	12.569
14	22 33 4.85	2.3367	4 9 30.9	12.597
15	22 35 25.02	2.3358	3 56 54.3	12.622
16	22 37 45.14	2.3349	3 44 16.2	12.647
17	22 40 5.21	2.3342	3 31 36.6	12.672
18	22 42 25.24	2.3334	3 18 55.6	12.694
19	22 44 45.22	2.3326	3 6 13.3	12.714
20	22 47 5.15	2.3318	2 53 29.9	12.732
21	22 49 25.03	2.3310	2 40 45.4	12.750
22	22 51 44.87	2.3303	2 27 59.9	12.767
23	22 54 4.67	2.3297	2 15 13.4	12.782
24	22 56 24.43	2.3290	S. 2 2 26.1	12.794

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 56 24.43	2.3290	S. 2 2 26.1	12.794
1	22 58 44.15	2.3284	1 49 38.1	12.805
2	23 1 3.84	2.3278	1 36 49.5	12.815
3	23 3 23.49	2.3272	1 24 0.3	12.823
4	23 5 43.11	2.3267	1 11 10.7	12.830
5	23 8 2.70	2.3262	0 58 20.7	12.835
6	23 10 22.25	2.3257	0 45 30.5	12.838
7	23 12 41.78	2.3252	0 32 40.1	12.841
8	23 15 1.28	2.3247	0 19 49.6	12.842
9	23 17 20.75	2.3243	S. 0 6 59.2	12.840
10	23 19 40.20	2.3240	N. 0 5 51.2	12.838
11	23 21 59.63	2.3237	0 18 41.4	12.834
12	23 24 19.05	2.3235	0 31 31.3	12.828
13	23 26 38.45	2.3232	0 44 20.8	12.822
14	23 28 57.83	2.3229	0 57 9.9	12.813
15	23 31 17.19	2.3226	1 9 58.4	12.803
16	23 33 36.54	2.3224	1 22 46.3	12.792
17	23 35 55.88	2.3223	1 35 33.5	12.779
18	23 38 15.21	2.3222	1 48 19.8	12.764
19	23 40 34.54	2.3221	2 1 5.2	12.748
20	23 42 53.86	2.3220	2 13 49.6	12.731
21	23 45 13.18	2.3219	2 26 32.9	12.712
22	23 47 32.49	2.3219	2 39 15.1	12.692
23	23 49 51.81	2.3220	N. 2 51 56.0	12.670

SATURDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 52 11.13	2.3220	N. 3 4 35.5	12.647
1	23 54 30.45	2.3221	3 17 13.6	12.622
2	23 56 49.78	2.3222	3 29 50.2	12.597
3	23 59 9.12	2.3224	3 42 25.2	12.569
4	0 1 28.47	2.3226	3 54 58.5	12.540
5	0 3 47.83	2.3228	4 7 30.0	12.509
6	0 6 7.20	2.3230	4 19 59.6	12.477
7	0 8 26.59	2.3232	4 32 27.3	12.444
8	0 10 45.99	2.3235	4 44 52.9	12.409
9	0 13 5.41	2.3238	4 57 16.4	12.373
10	0 15 24.85	2.3242	5 9 37.7	12.336
11	0 17 44.31	2.3245	5 21 56.7	12.297
12	0 20 3.79	2.3249	5 34 13.4	12.257
13	0 22 23.30	2.3253	5 46 27.6	12.215
14	0 24 42.83	2.3257	5 58 39.2	12.172
15	0 27 2.39	2.3262	6 10 48.3	12.129
16	0 29 21.98	2.3267	6 22 54.7	12.083
17	0 31 41.60	2.3273	6 34 58.3	12.036
18	0 34 1.26	2.3279	6 46 59.0	11.987
19	0 36 20.95	2.3284	6 58 56.8	11.938
20	0 38 40.67	2.3290	7 10 51.6	11.886
21	0 41 0.43	2.3297	7 22 43.2	11.833
22	0 43 20.23	2.3303	7 34 31.6	11.780
23	0 45 40.07	2.3310	7 46 16.8	11.727
24	0 47 59.95	2.3317	N. 7 57 58.8	11.671

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 47 59.95	2.3317	N. 7 57 58.8	11.671
1	0 50 19.87	2.3324	8 9 37.3	11.613
2	0 52 39.84	2.3331	8 21 12.3	11.554
3	0 54 59.85	2.3338	8 32 43.8	11.494
4	0 57 19.90	2.3346	8 44 11.6	11.433
5	0 59 40.00	2.3354	8 55 35.7	11.371
6	1 2 0.15	2.3362	9 6 56.1	11.307
7	1 4 20.35	2.3371	9 18 12.6	11.242
8	1 6 40.60	2.3379	9 29 25.2	11.177
9	1 9 0.90	2.3387	9 40 33.8	11.110
10	1 11 21.25	2.3396	9 51 38.4	11.042
11	1 13 41.65	2.3405	10 2 38.8	10.972
12	1 16 2.11	2.3414	10 13 35.0	10.901
13	1 18 22.62	2.3423	10 24 26.9	10.829
14	1 20 43.19	2.3433	10 35 14.5	10.757
15	1 23 3.82	2.3442	10 45 57.7	10.682
16	1 25 24.50	2.3452	10 56 36.4	10.607
17	1 27 45.24	2.3462	11 7 10.6	10.531
18	1 30 6.04	2.3472	11 17 40.1	10.454
19	1 32 26.90	2.3482	11 28 5.0	10.376
20	1 34 47.82	2.3492	11 38 25.2	10.296
21	1 37 8.80	2.3501	11 48 40.5	10.215
22	1 39 29.83	2.3510	11 58 51.0	10.134
23	1 41 50.92	2.3520	N.12 8 56.6	10.052

MONDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 44 12.07	2.3530	N.12 18 57.2	9.968
1	1 46 33.28	2.3541	12 28 52.7	9.883
2	1 48 54.56	2.3552	12 38 43.2	9.798
3	1 51 15.90	2.3562	12 48 28.5	9.712
4	1 53 37.30	2.3572	12 58 8.6	9.624
5	1 55 58.76	2.3582	13 7 43.4	9.535
6	1 58 20.29	2.3593	13 17 12.8	9.446
7	2 0 41.88	2.3603	13 26 36.9	9.356
8	2 3 3.53	2.3612	13 35 55.5	9.264
9	2 5 25.23	2.3622	13 45 8.6	9.172
10	2 7 47.00	2.3633	13 54 16.2	9.080
11	2 10 8.83	2.3643	14 3 18.2	8.986
12	2 12 30.72	2.3653	14 12 14.5	8.891
13	2 14 52.67	2.3663	14 21 5.1	8.795
14	2 17 14.68	2.3673	14 29 49.9	8.699
15	2 19 36.75	2.3682	14 38 29.0	8.602
16	2 21 58.87	2.3692	14 47 2.2	8.503
17	2 24 21.05	2.3702	14 55 29.4	8.404
18	2 26 43.29	2.3711	15 3 50.7	8.305
19	2 29 5.58	2.3720	15 12 6.0	8.204
20	2 31 27.93	2.3729	15 20 15.2	8.103
21	2 33 50.33	2.3738	15 28 18.4	8.002
22	2 36 12.78	2.3747	15 36 15.4	7.899
23	2 38 35.29	2.3756	15 44 6.3	7.796
24	2 40 57.85	2.3764	N.15 51 51.0	7.693

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 13.					**THURSDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 40 57.85	2.3764	N.15 51 51.0	7.693	0	4 35 25.70	2.3778	N.19 51 26.2	2.165
1	2 43 20.46	2.3772	15 59 29.4	7.588	1	4 37 48.34	2.3767	19 53 32.5	2.045
2	2 45 43.12	2.3780	16 7 1.5	7.482	2	4 40 10.91	2.3757	19 55 31.6	1.925
3	2 48 5.82	2.3787	16 14 27.2	7.375	3	4 42 33.42	2.3746	19 57 23.5	1.806
4	2 50 28.57	2.3795	16 21 46.5	7.268	4	4 44 55.86	2.3734	19 59 8.3	1.687
5	2 52 51.36	2.3802	16 28 59.4	7.161	5	4 47 18.22	2.3721	20 0 45.9	1.567
6	2 55 14.20	2.3810	16 36 5.9	7.053	6	4 49 40.51	2.3708	20 2 16.3	1.447
7	2 57 37.08	2.3817	16 43 5.8	6.944	7	4 52 2.72	2.3694	20 3 39.5	1.327
8	3 0 0.00	2.3823	16 49 59.2	6.836	8	4 54 24.84	2.3680	20 4 55.6	1.208
9	3 2 22.95	2.3829	16 56 46.1	6.727	9	4 56 46.88	2.3666	20 6 4.5	1.089
10	3 4 45.94	2.3835	17 3 26.4	6.616	10	4 59 8.83	2.3650	20 7 6.3	0.970
11	3 7 8.97	2.3841	17 10 0.0	6.505	11	5 1 30.68	2.3634	20 8 0.9	0.850
12	3 9 32.03	2.3846	17 16 27.0	6.394	12	5 3 52.44	2.3618	20 8 48.3	0.731
13	3 11 55.12	2.3851	17 22 47.3	6.282	13	5 6 14.10	2.3602	20 9 28.6	0.613
14	3 14 18.24	2.3856	17 29 0.8	6.169	14	5 8 35.66	2.3584	20 10 1.9	0.496
15	3 16 41.39	2.3861	17 35 7.6	6.057	15	5 10 57.11	2.3567	20 10 28.1	0.378
16	3 19 4.57	2.3865	17 41 7.6	5.943	16	5 13 18.46	2.3549	20 10 47.2	0.260
17	3 21 27.77	2.3868	17 47 0.8	5.830	17	5 15 39.70	2.3530	20 10 59.3	0.142
18	3 23 50.99	2.3872	17 52 47.2	5.716	18	5 18 0.82	2.3511	20 11 4.3	+ 0.025
19	3 26 14.23	2.3875	17 58 26.7	5.601	19	5 20 21.83	2.3491	20 11 2.3	− 0.092
20	3 28 37.49	2.3878	18 3 59.3	5.487	20	5 22 42.71	2.3470	20 10 53.3	0.208
21	3 31 0.77	2.3881	18 9 25.1	5.372	21	5 25 3.47	2.3450	20 10 37.3	0.324
22	3 33 24.06	2.3882	18 14 43.9	5.255	22	5 27 24.11	2.3429	20 10 14.4	0.440
23	3 35 47.36	2.3883	N.18 19 55.7	5.139	23	5 29 44.62	2.3407	N.20 9 44.5	0.556
	WEDNESDAY 14.					**FRIDAY 16.**			
0	3 38 10.66	2.3884	N.18 25 0.6	5.022	0	5 32 5.00	2.3385	N.20 9 7.7	0.671
1	3 40 33.97	2.3886	18 29 58.5	4.906	1	5 34 25.24	2.3362	20 8 24.0	0.786
2	3 42 57.29	2.3887	18 34 49.4	4.789	2	5 36 45.35	2.3340	20 7 33.4	0.901
3	3 45 20.61	2.3887	18 39 33.2	4.672	3	5 39 5.32	2.3317	20 6 35.9	1.015
4	3 47 43.93	2.3886	18 44 10.0	4.554	4	5 41 25.15	2.3293	20 5 31.6	1.128
5	3 50 7.24	2.3884	18 48 39.7	4.436	5	5 43 44.83	2.3268	20 4 20.5	1.241
6	3 52 30.54	2.3882	18 53 2.3	4.317	6	5 46 4.36	2.3243	20 3 2.7	1.353
7	3 54 53.83	2.3881	18 57 17.8	4.199	7	5 48 23.74	2.3218	20 1 38.1	1.466
8	3 57 17.11	2.3879	19 1 26.2	4.081	8	5 50 42.97	2.3192	20 0 6.8	1.578
9	3 59 40.38	2.3877	19 5 27.5	3.962	9	5 53 2.04	2.3166	19 58 28.7	1.690
10	4 2 3.63	2.3873	19 9 21.6	3.843	10	5 55 20.96	2.3139	19 56 44.0	1.800
11	4 4 26.86	2.3870	19 13 8.6	3.724	11	5 57 39.71	2.3112	19 54 52.7	1.911
12	4 6 50.07	2.3867	19 16 48.5	3.605	12	5 59 58.30	2.3084	19 52 54.7	2.022
13	4 9 13.26	2.3862	19 20 21.2	3.485	13	6 2 16.72	2.3057	19 50 50.1	2.131
14	4 11 36.41	2.3856	19 23 46.7	3.365	14	6 4 34.98	2.3029	19 48 39.0	2.239
15	4 13 59.53	2.3850	19 27 5.0	3.245	15	6 6 53.07	2.3000	19 46 21.4	2.348
16	4 16 22.61	2.3844	19 30 16.1	3.126	16	6 9 10.98	2.2971	19 43 57.3	2.456
17	4 18 45.66	2.3838	19 33 20.1	3.007	17	6 11 28.72	2.2942	19 41 26.7	2.563
18	4 21 8.67	2.3831	19 36 16.9	2.886	18	6 13 46.28	2.2912	19 38 49.7	2.670
19	4 23 31.63	2.3823	19 39 6.4	2.766	19	6 16 3.66	2.2882	19 36 6.3	2.776
20	4 25 54.55	2.3816	19 41 48.8	2.647	20	6 18 20.86	2.2851	19 33 16.6	2.882
21	4 28 17.42	2.3807	19 44 24.0	2.527	21	6 20 37.87	2.2820	19 30 20.5	2.987
22	4 30 40.24	2.3798	19 46 52.0	2.406	22	6 22 54.70	2.2789	19 27 18.1	3.092
23	4 33 3.00	2.3788	19 49 12.7	2.285	23	6 25 11.34	2.2758	19 24 9.5	3.195
24	4 35 25.70	2.3778	N.19 51 26.2	2.165	24	6 27 27.80	2.2727	N.19 20 54.7	3.298

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff for 1 Minute.
	h m s	s	° ′ ″	″
0	6 27 27.80	2.2727	N.19 20 54.7	3.298
1	6 29 44.06	2.2694	19 17 33.7	3.401
2	6 32 0.13	2.2661	19 14 6.5	3.504
3	6 34 16.00	2.2628	19 10 33.2	3.605
4	6 36 31.67	2.2596	19 6 53.9	3.705
5	6 38 47.15	2.2563	19 3 8.6	3.805
6	6 41 2.43	2.2529	18 59 17.3	3.905
7	6 43 17.50	2.2495	18 55 20.0	4.004
8	6 45 32.37	2.2462	18 51 16.8	4.102
9	6 47 47.04	2.2427	18 47 7.8	4.199
10	6 50 1.50	2.2392	18 42 52.9	4.296
11	6 52 15.75	2.2357	18 38 32.2	4.392
12	6 54 29.79	2.2322	18 34 5.8	4.487
13	6 56 43.62	2.2287	18 29 33.7	4.582
14	6 58 57.24	2.2252	18 24 55.9	4.676
15	7 1 10.65	2.2217	18 20 12.5	4.769
16	7 3 23.84	2.2181	18 15 23.6	4.862
17	7 5 36.82	2.2146	18 10 29.1	4.954
18	7 7 49.59	2.2110	18 5 29.1	5.045
19	7 10 2.14	2.2073	18 0 23.7	5.135
20	7 12 14.47	2.2037	17 55 12.9	5.225
21	7 14 26.58	2.2000	17 49 56.7	5.314
22	7 16 38.47	2.1963	17 44 35.2	5.402
23	7 18 50.14	2.1927	N.17 39 8.5	5.489

SUNDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff for 1 Minute.
0	7 21 1.60	2.1891	N.17 33 36.5	5.576
1	7 23 12.83	2.1854	17 27 59.3	5.662
2	7 25 23.84	2.1817	17 22 17.1	5.746
3	7 27 34.63	2.1780	17 16 29.8	5.830
4	7 29 45.20	2.1742	17 10 37.5	5.914
5	7 31 55.54	2.1705	17 4 40.1	5.997
6	7 34 5.66	2.1668	16 58 37.8	6.079
7	7 36 15.56	2.1631	16 52 30.6	6.161
8	7 38 25.23	2.1593	16 46 18.5	6.241
9	7 40 34.68	2.1556	16 40 1.7	6.320
10	7 42 43.90	2.1518	16 33 40.1	6.399
11	7 44 52.90	2.1481	16 27 13.8	6.477
12	7 47 1.68	2.1444	16 20 42.9	6.553
13	7 49 10.23	2.1407	16 14 7.4	6.630
14	7 51 18.56	2.1369	16 7 27.3	6.707
15	7 53 26.66	2.1332	16 0 42.6	6.782
16	7 55 34.54	2.1295	15 53 53.5	6.855
17	7 57 42.20	2.1257	15 47 0.0	6.927
18	7 59 49.63	2.1220	15 40 2.2	7.000
19	8 1 56.84	2.1183	15 33 0.0	7.072
20	8 4 3.83	2.1146	15 25 53.6	7.143
21	8 6 10.60	2.1109	15 18 42.9	7.213
22	8 8 17.14	2.1072	15 11 28.0	7.282
23	8 10 23.46	2.1035	15 4 9.0	7.350
24	8 12 29.56	2.0998	N.14 56 46.0	7.417

MONDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 12 29.56	2.0998	N.14 56 46.0	7.417
1	8 14 35.44	2.0962	14 49 19.0	7.483
2	8 16 41.10	2.0926	14 41 48.0	7.550
3	8 18 46.55	2.0890	14 34 13.0	7.616
4	8 20 51.78	2.0853	14 26 34.1	7.680
5	8 22 56.79	2.0817	14 18 51.4	7.743
6	8 25 1.58	2.0781	14 11 4.9	7.806
7	8 27 6.16	2.0745	14 3 14.7	7.867
8	8 29 10.52	2.0709	13 55 20.8	7.928
9	8 31 14.67	2.0674	13 47 23.3	7.988
10	8 33 18.61	2.0639	13 39 22.2	8.047
11	8 35 22.34	2.0603	13 31 17.6	8.106
12	8 37 25.85	2.0567	13 23 9.5	8.164
13	8 39 29.15	2.0533	13 14 57.9	8.221
14	8 41 32.25	2.0499	13 6 43.0	8.277
15	8 43 35.14	2.0464	12 58 24.7	8.332
16	8 45 37.82	2.0430	12 50 3.1	8.387
17	8 47 40.30	2.0396	12 41 38.3	8.440
18	8 49 42.57	2.0362	12 33 10.3	8.493
19	8 51 44.64	2.0328	12 24 39.1	8.545
20	8 53 46.51	2.0295	12 16 4.9	8.596
21	8 55 48.18	2.0262	12 7 27.6	8.647
22	8 57 49.66	2.0230	11 58 47.3	8.697
23	8 59 50.94	2.0197	N.11 50 4.0	8.746

TUESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 1 52.02	2.0164	N.11 41 17.8	8.793
1	9 3 52.91	2.0132	11 32 28.8	8.840
2	9 5 53.61	2.0100	11 23 37.0	8.887
3	9 7 54.11	2.0068	11 14 42.4	8.932
4	9 9 54.42	2.0037	11 5 45.1	8.977
5	9 11 54.55	2.0007	10 56 45.2	9.020
6	9 13 54.50	1.9976	10 47 42.7	9.063
7	9 15 54.26	1.9945	10 38 37.6	9.106
8	9 17 53.84	1.9914	10 29 29.9	9.149
9	9 19 53.23	1.9884	10 20 19.7	9.190
10	9 21 52.45	1.9855	10 11 7.1	9.229
11	9 23 51.49	1.9826	10 1 52.2	9.268
12	9 25 50.36	1.9797	9 52 34.9	9.307
13	9 27 49.06	1.9768	9 43 15.3	9.345
14	9 29 47.58	1.9739	9 33 53.5	9.381
15	9 31 45.93	1.9712	9 24 29.6	9.417
16	9 33 44.12	1.9684	9 15 3.5	9.452
17	9 35 42.14	1.9656	9 5 35.3	9.487
18	9 37 39.99	1.9628	8 56 5.0	9.522
19	9 39 37.68	1.9602	8 46 32.7	9.554
20	9 41 35.21	1.9576	8 36 58.5	9.586
21	9 43 32.59	1.9550	8 27 22.4	9.617
22	9 45 29.81	1.9524	8 17 44.4	9.648
23	9 47 26.88	1.9498	8 8 4.6	9.678
24	9 49 23.79	1.9472	N. 7 58 23.0	9.707

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 49 23.79	1.9472	N. 7 58 23.0	9.707
1	9 51 20.55	1.9448	7 48 39.7	9.736
2	9 53 17.17	1.9424	7 38 54.7	9.764
3	9 55 13.64	1.9399	7 29 8.0	9.791
4	9 57 9.96	1.9376	7 19 19.7	9.817
5	9 59 6.15	1.9353	7 9 29.9	9.842
6	10 1 2.20	1.9330	6 59 38.6	9.867
7	10 2 58.11	1.9307	6 49 45.8	9.892
8	10 4 53.89	1.9285	6 39 51.6	9.915
9	10 6 49.53	1.9263	6 29 56.0	9.937
10	10 8 45.04	1.9242	6 19 59.1	9.959
11	10 10 40.43	1.9221	6 10 0.9	9.980
12	10 12 35.69	1.9200	6 0 1.5	10.000
13	10 14 30.83	1.9179	5 50 0.9	10.020
14	10 16 25.84	1.9158	5 39 59.1	10.040
15	10 18 20.73	1.9139	5 29 56.1	10.058
16	10 20 15.51	1.9120	5 19 52.1	10.075
17	10 22 10.17	1.9101	5 9 47.1	10.091
18	10 24 4.72	1.9082	4 59 41.2	10.107
19	10 25 59.16	1.9064	4 49 34.3	10.122
20	10 27 53.49	1.9047	4 39 26.5	10.137
21	10 29 47.72	1.9029	4 29 17.8	10.152
22	10 31 41.84	1.9012	4 19 8.3	10.165
23	10 33 35.86	1.8996	N. 4 8 58.0	10.177

THURSDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 35 29.79	1.8980	N. 3 58 47.0	10.189
1	10 37 23.62	1.8964	3 48 35.3	10.200
2	10 39 17.36	1.8948	3 38 23.0	10.210
3	10 41 11.00	1.8932	3 28 10.1	10.220
4	10 43 4.55	1.8918	3 17 56.6	10.229
5	10 44 58.02	1.8905	3 7 42.6	10.238
6	10 46 51.41	1.8891	2 57 28.0	10.246
7	10 48 44.71	1.8877	2 47 13.0	10.253
8	10 50 37.93	1.8864	2 36 57.6	10.259
9	10 52 31.08	1.8852	2 26 41.9	10.264
10	10 54 24.16	1.8840	2 16 25.9	10.269
11	10 56 17.16	1.8828	2 6 9.6	10.274
12	10 58 10.09	1.8816	1 55 53.0	10.278
13	11 0 2.95	1.8805	1 45 36.2	10.281
14	11 1 55.75	1.8795	1 35 19.3	10.283
15	11 3 48.49	1.8785	1 25 2.3	10.284
16	11 5 41.17	1.8775	1 14 45.2	10.285
17	11 7 33.79	1.8766	1 4 28.1	10.286
18	11 9 26.36	1.8757	0 54 10.9	10.286
19	11 11 18.87	1.8748	0 43 53.8	10.284
20	11 13 11.34	1.8741	0 33 36.8	10.282
21	11 15 3.76	1.8733	0 23 19.9	10.280
22	11 16 56.14	1.8726	0 13 3.2	10.278
23	11 18 48.47	1.8719	N. 0 2 46.6	10.275
24	11 20 40.76	1.8712	S. 0 7 29.8	10.271

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 20 40.76	1.8712	S. 0 7 29.8	10.271
1	11 22 33.01	1.8706	0 17 45.9	10.265
2	11 24 25.23	1.8701	0 28 1.6	10.259
3	11 26 17.42	1.8696	0 38 17.0	10.253
4	11 28 9.58	1.8691	0 48 32.0	10.247
5	11 30 1.71	1.8686	0 58 46.6	10.240
6	11 31 53.81	1.8682	1 9 0.8	10.232
7	11 33 45.89	1.8679	1 19 14.5	10.223
8	11 35 37.95	1.8676	1 29 27.6	10.213
9	11 37 30.00	1.8673	1 39 40.1	10.203
10	11 39 22.03	1.8671	1 49 52.0	10.193
11	11 41 14.05	1.8668	2 0 3.2	10.182
12	11 43 6.05	1.8667	2 10 13.8	10.170
13	11 44 58.05	1.8667	2 20 23.6	10.157
14	11 46 50.05	1.8666	2 30 32.7	10.145
15	11 48 42.04	1.8665	2 40 41.0	10.132
16	11 50 34.03	1.8665	2 50 48.5	10.117
17	11 52 26.02	1.8666	3 0 55.1	10.102
18	11 54 18.02	1.8667	3 11 0.8	10.087
19	11 56 10.02	1.8668	3 21 5.6	10.071
20	11 58 2.03	1.8670	3 31 9.4	10.054
21	11 59 54.06	1.8672	3 41 12.1	10.037
22	12 1 46.10	1.8675	3 51 13.8	10.019
23	12 3 38.16	1.8678	S. 4 1 14.4	10.001

SATURDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 5 30.24	1.8682	S. 4 11 13.9	9.982
1	12 7 22.34	1.8685	4 21 12.3	9.962
2	12 9 14.46	1.8689	4 31 9.4	9.942
3	12 11 6.61	1.8694	4 41 5.3	9.921
4	12 12 58.79	1.8699	4 50 59.9	9.899
5	12 14 51.00	1.8705	5 0 53.2	9.677
6	12 16 43.25	1.8711	5 10 45.2	9.855
7	12 18 35.53	1.8717	5 20 35.8	9.832
8	12 20 27.85	1.8724	5 30 25.0	9.808
9	12 22 20.22	1.8731	5 40 12.8	9.784
10	12 24 12.63	1.8738	5 49 59.1	9.759
11	12 26 5.08	1.8746	5 59 43.9	9.733
12	12 27 57.58	1.8754	6 9 27.1	9.707
13	12 29 50.13	1.8763	6 19 8.7	9.680
14	12 31 42.73	1.8772	6 28 48.7	9.653
15	12 33 35.39	1.8782	6 38 27.1	9.626
16	12 35 28.11	1.8792	6 48 3.8	9.597
17	12 37 20.89	1.8802	6 57 38.7	9.567
18	12 39 13.73	1.8813	7 7 11.8	9.537
19	12 41 6.64	1.8824	7 16 43.1	9.507
20	12 42 59.62	1.8835	7 26 12.6	9.477
21	12 44 52.66	1.8847	7 35 40.3	9.446
22	12 46 45.78	1.8859	7 45 6.1	9.413
23	12 48 38.97	1.8871	7 54 29.9	9.380
24	12 50 32.23	1.8883	S. 8 3 51.7	9.347

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.					**TUESDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 50 32.23	1.8883	S. 8 3 51.7	9.347	0	14 23 21.13	1.9913	S. 14 43 16.0	7.071
1	12 52 25.57	1.8897	8 13 11.5	9.313	1	14 25 20.69	1.9942	14 50 18.4	7.008
2	12 54 19.00	1.8912	8 22 29.3	9.279	2	14 27 20.43	1.9971	14 57 17.0	6.946
3	12 56 12.51	1.8926	8 31 45.0	9.244	3	14 29 20.34	2.0000	15 4 11.9	6.883
4	12 58 6.11	1.8941	8 40 58.6	9.208	4	14 31 20.43	2.0030	15 11 3.0	6.820
5	12 59 59.80	1.8955	8 50 10.0	9.173	5	14 33 20.70	2.0059	15 17 50.3	6.756
6	13 1 53.57	1.8969	8 59 19.3	9.137	6	14 35 21.14	2.0088	15 24 33.7	6.691
7	13 3 47.43	1.8985	9 8 26.4	9.099	7	14 37 21.76	2.0118	15 31 13.2	6.625
8	13 5 41.39	1.9002	9 17 31.2	9.061	8	14 39 22.56	2.0149	15 37 48.7	6.559
9	13 7 35.45	1.9018	9 26 33.7	9.022	9	14 41 23.55	2.0180	15 44 20.3	6.493
10	13 9 29.61	1.9035	9 35 33.9	8.983	10	14 43 24.72	2.0210	15 50 47.9	6.426
11	13 11 23.87	1.9052	9 44 31.7	8.943	11	14 45 26.07	2.0241	15 57 11.4	6.358
12	13 13 18.23	1.9069	9 53 27.1	8.903	12	14 47 27.61	2.0272	16 3 30.8	6.289
13	13 15 12.70	1.9087	10 2 20.1	8.863	13	14 49 29.34	2.0304	16 9 46.1	6.221
14	13 17 7.28	1.9105	10 11 10.7	8.822	14	14 51 31.26	2.0335	16 15 57.3	6.152
15	13 19 1.96	1.9123	10 19 58.8	8.780	15	14 53 33.36	2.0366	16 22 4.3	6.081
16	13 20 56.76	1.9142	10 28 44.3	8.737	16	14 55 35.65	2.0398	16 28 7.0	6.010
17	13 22 51.67	1.9161	10 37 27.2	8.693	17	14 57 38.13	2.0430	16 34 5.5	5.939
18	13 24 46.69	1.9180	10 46 7.5	8.650	18	14 59 40.81	2.0462	16 39 59.7	5.867
19	13 26 41.83	1.9201	10 54 45.2	8.606	19	15 1 43.68	2.0494	16 45 49.5	5.794
20	13 28 37.10	1.9222	11 3 20.2	8.561	20	15 3 46.74	2.0526	16 51 35.0	5.721
21	13 30 32.49	1.9242	11 11 52.5	8.516	21	15 5 49.99	2.0558	16 57 16.1	5.647
22	13 32 28.00	1.9262	11 20 22.1	8.471	22	15 7 53.44	2.0591	17 2 52.7	5.572
23	13 34 23.64	1.9284	S. 11 28 49.0	8.425	23	15 9 57.09	2.0624	S. 17 8 24.8	5.496
	MONDAY 26.					**WEDNESDAY 28.**			
0	13 36 19.41	1.9306	S. 11 37 13.1	8.377	0	15 12 0.93	2.0657	S. 17 13 52.5	5.423
1	13 38 15.31	1.9327	11 45 34.3	8.329	1	15 14 4.97	2.0690	17 19 15.6	5.347
2	13 40 11.34	1.9349	11 53 52.6	8.281	2	15 16 9.21	2.0723	17 24 34.1	5.270
3	13 42 7.50	1.9372	12 2 8.0	8.232	3	15 18 13.65	2.0756	17 29 48.0	5.192
4	13 44 3.80	1.9395	12 10 20.5	8.183	4	15 20 18.29	2.0789	17 34 57.2	5.114
5	13 46 0.24	1.9418	12 18 30.0	8.132	5	15 22 23.12	2.0822	17 40 1.7	5.036
6	13 47 56.81	1.9441	12 26 36.4	8.082	6	15 24 28.15	2.0855	17 45 1.5	4.957
7	13 49 53.53	1.9465	12 34 39.8	8.031	7	15 26 33.38	2.0888	17 49 56.6	4.877
8	13 51 50.39	1.9489	12 42 40.1	7.979	8	15 28 38.81	2.0922	17 54 46.8	4.797
9	13 53 47.40	1.9513	12 50 37.3	7.927	9	15 30 44.45	2.0956	17 59 32.2	4.716
10	13 55 44.55	1.9537	12 58 31.3	7.873	10	15 32 50.29	2.0990	18 4 12.7	4.634
11	13 57 41.85	1.9563	13 6 22.1	7.820	11	15 34 56.33	2.1023	18 8 48.3	4.552
12	13 59 39.31	1.9589	13 14 9.7	7.766	12	15 37 2.57	2.1057	18 13 19.0	4.470
13	14 1 36.92	1.9614	13 21 54.0	7.711	13	15 39 9.01	2.1091	18 17 44.7	4.387
14	14 3 34.68	1.9640	13 29 35.0	7.656	14	15 41 15.66	2.1125	18 22 5.4	4.302
15	14 5 32.60	1.9666	13 37 12.7	7.600	15	15 43 22.51	2.1158	18 26 21.0	4.217
16	14 7 30.68	1.9692	13 44 47.0	7.543	16	15 45 29.56	2.1192	18 30 31.5	4.132
17	14 9 28.91	1.9718	13 52 17.9	7.487	17	15 47 36.81	2.1226	18 34 36.9	4.047
18	14 11 27.30	1.9745	13 59 45.4	7.429	18	15 49 44.27	2.1260	18 38 37.2	3.962
19	14 13 25.85	1.9773	14 7 9.4	7.371	19	15 51 51.93	2.1293	18 42 32.3	3.875
20	14 15 24.57	1.9801	14 14 29.9	7.312	20	15 53 59.79	2.1327	18 46 22.2	3.787
21	14 17 23.46	1.9829	14 21 46.8	7.252	21	15 56 7.86	2.1361	18 50 6.8	3.699
22	14 19 22.52	1.9857	14 29 0.2	7.192	22	15 58 16.13	2.1395	18 53 46.1	3.611
23	14 21 21.74	1.9684	14 36 9.9	7.132	23	16 0 24.60	2.1428	18 57 20.1	3.522
24	14 23 21.13	1.9913	S. 14 43 16.0	7.071	24	16 2 33.27	2.1462	S. 19 0 48.7	3.432

GREENWICH MEAN TIME.

PHASES OF THE MOON.

	d	h	m
● New Moon	7	6	10.1
☽ First Quarter	13	21	54.9
○ Full Moon	21	12	18.1

	d	h
☾ Perigee	9	2.9
☾ Apogee	24	22.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Regulus	W.	85° 56′ 37″	2915	87° 28′ 37″	2902	89° 0′ 53″	2888	90° 33′ 27″	2875
	Spica	W.	32 3 27	2895	33 35 52	2883	35 8 33	2869	36 41 31	2855
	VENUS	E.	32 27 48	3219	31 2 1	3204	29 35 57	3191	28 9 37	3176
	SUN	E.	78 10 33	3288	76 46 8	3274	75 21 26	3259	73 56 27	3245
2	Regulus	W.	98 20 49	2801	99 55 16	2785	101 30 3	2769	103 5 11	2754
	Spica	W.	44 30 58	2781	46 5 51	2766	47 41 4	2750	49 16 38	2733
	SUN	E.	66 47 3	3166	65 20 13	3149	63 53 3	3133	62 25 33	3115
3	Regulus	W.	111 6 12	2671	112 43 31	2654	114 21 13	2637	115 59 18	2620
	Spica	W.	57 20 1	2649	58 57 50	2631	60 36 3	2614	62 14 39	2595
	SUN	E.	55 2 43	3027	53 33 4	3009	52 3 2	2990	50 32 37	2973
4	Spica	W.	70 33 49	2507	72 14 53	2489	73 56 22	2472	75 38 15	2454
	Antares	W.	25 46 19	2646	27 24 11	2614	29 2 47	2584	30 42 4	2556
	SUN	E.	42 55 0	2885	41 22 22	2868	39 49 22	2852	38 16 2	2836
5	Spica	W.	84 13 51	2368	85 58 11	2353	87 42 54	2336	89 28 1	2320
	Antares	W.	39 7 36	2436	40 50 20	2415	42 33 34	2394	44 17 17	2375
	SUN	E.	30 24 26	2768	28 49 16	2757	27 13 52	2748	25 38 16	2741
9	SUN	W.	24 29 38	2478	26 11 22	2467	27 53 21	2460	29 35 30	2455
	α Arietis	E.	51 18 51	2172	49 29 42	2179	47 40 42	2186	45 51 53	2194
	SATURN	E.	65 20 2	2091	63 28 49	2092	61 37 38	2094	59 46 29	2096
	Aldebaran	E.	84 3 37	2087	82 12 17	2087	80 20 58	2088	78 29 41	2091
	JUPITER	E.	96 50 7	2077	94 58 33	2079	93 7 1	2080	91 15 31	2082
10	SUN	W.	38 7 18	2453	39 49 38	2455	41 31 54	2459	43 14 5	2462
	α Arietis	E.	36 51 56	2266	35 5 6	2287	33 18 47	2311	31 33 4	2340
	SATURN	E.	50 31 52	2116	48 41 17	2121	46 50 50	2127	45 0 32	2133
	Aldebaran	E.	69 14 26	2111	67 23 43	2116	65 33 8	2122	63 42 42	2129
	JUPITER	E.	81 59 8	2101	80 8 11	2107	78 17 23	2113	76 26 44	2119
	Pollux	E.	111 31 25	2198	109 42 54	2201	107 54 28	2205	106 6 8	2210
11	SUN	W.	51 43 8	2496	53 24 27	2504	55 5 34	2514	56 46 28	2522
	α Pegasi	W.	27 31 10	2971	29 1 59	2891	30 34 29	2826	32 8 23	2772
	SATURN	E.	35 51 49	2174	34 2 43	2184	32 13 51	2194	30 25 14	2204
	Aldebaran	E.	54 33 22	2169	52 44 8	2179	50 55 9	2188	49 6 24	2199
	JUPITER	E.	67 16 11	2159	65 26 42	2168	63 37 27	2178	61 48 26	2188
	Pollux	E.	97 6 32	2243	95 19 8	2251	93 31 57	2260	91 44 59	2269
12	SUN	W.	65 7 36	2575	66 47 5	2586	68 26 19	2598	70 5 17	2610
	α Pegasi	W.	40 11 43	2622	41 50 8	2607	43 28 53	2595	45 7 54	2587
	Aldebaran	E.	40 6 44	2257	38 19 41	2269	36 32 56	2283	34 46 31	2296
	JUPITER	E.	52 47 14	2242	50 59 49	2254	49 12 41	2266	47 25 51	2278
	Pollux	E.	82 53 48	2323	81 8 22	2335	79 23 14	2348	77 38 24	2360
	Regulus	E.	119 35 33	2261	117 48 36	2272	116 1 55	2283	114 15 30	2293
13	SUN	W.	78 15 56	2672	79 53 13	2685	81 30 13	2698	83 6 56	2711
	α Pegasi	W.	53 24 59	2574	55 4 30	2576	56 43 58	2578	58 23 23	2582
	JUPITER	E.	38 36 14	2342	36 51 15	2355	35 6 36	2368	33 22 16	2382
	Pollux	E.	68 58 55	2429	67 16 1	2443	65 33 28	2458	63 51 16	2474

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Regulus	W.	92° 6′ 18″	2861	93° 39′ 27″	2846	95° 12′ 55″	2831	96° 46′ 42″	2816
	Spica	W.	38 14 47	2841	39 48 21	2827	41 22 14	2812	42 56 26	2797
	Venus	E.	26 42 59	3162	25 16 4	3147	23 48 51	3132	22 21 20	3116
	Sun	E.	72 31 11	3230	71 5 37	3214	69 39 45	3198	68 13 34	3182
2	Regulus	W.	104 40 39	2738	106 16 29	2721	107 52 41	2704	109 29 15	2687
	Spica	W.	50 52 34	2716	52 28 52	2700	54 5 32	2683	55 42 35	2666
	Sun	E.	60 57 42	3098	59 29 30	3080	58 0 56	3062	56 32 0	3045
3	Regulus	W.	117 37 46	2603	119 16 37	2586	120 55 51	2569	122 35 29	2552
	Spica	W.	63 53 40	2578	65 33 5	2560	67 12 55	2542	68 53 10	2525
	Sun	E.	49 1 50	2955	47 30 41	2938	45 59 10	2920	44 27 16	2902
4	Spica	W.	77 20 33	2436	79 3 16	2419	80 46 23	2402	82 29 55	2385
	Antares	W.	32 22 0	2529	34 2 33	2504	35 43 41	2480	37 25 23	2458
	Sun	E.	36 42 21	2821	35 8 20	2806	33 34 0	2791	31 59 21	2779
5	Spica	W.	91 13 31	2304	92 59 24	2289	94 45 39	2275	96 32 15	2260
	Antares	W.	46 1 28	2357	47 46 5	2339	49 31 8	2321	51 16 37	2304
	Sun	E.	24 2 31	2738	22 26 42	2738	20 50 53	2743	19 15 10	2753
9	Sun	W.	31 17 46	2452	33 0 7	2450	34 42 31	2450	36 24 55	2450
	α Arietis	E.	44 3 17	2205	42 14 57	2217	40 26 55	2231	38 39 14	2247
	Saturn	E.	57 55 23	2098	56 4 21	2102	54 13 25	2106	52 22 35	2111
	Aldebaran	E.	76 38 28	2094	74 47 19	2097	72 56 15	2101	71 5 17	2105
	Jupiter	E.	89 24 4	2084	87 32 41	2088	85 41 24	2092	83 50 13	2096
10	Sun	W.	44 56 11	2468	46 38 9	2474	48 19 58	2481	50 1 38	2488
	α Arietis	E.	29 48 3	2373	28 3 49	2412	26 20 31	2458	24 38 19	2514
	Saturn	E.	43 10 24	2141	41 20 27	2149	39 30 42	2157	37 41 9	2165
	Aldebaran	E.	61 52 27	2136	60 2 23	2143	58 12 30	2152	56 22 50	2160
	Jupiter	E.	74 36 14	2126	72 45 55	2134	70 55 48	2142	69 5 53	2151
	Pollux	E.	104 17 55	2215	102 29 50	2221	100 41 54	2228	98 54 8	2235
11	Sun	W.	58 27 10	2532	60 7 39	2543	61 47 53	2553	63 27 52	2564
	α Pegasi	W.	33 43 27	2728	35 19 29	2694	36 56 17	2665	38 33 44	2641
	Saturn	E.	28 36 52	2215	26 48 47	2226	25 0 59	2238	23 13 28	2250
	Aldebaran	E.	47 17 55	2210	45 29 42	2221	43 41 45	2233	41 54 6	2244
	Jupiter	E.	59 59 40	2198	51 11 10	2208	56 22 55	2219	54 34 56	2231
	Pollux	E.	89 58 14	2279	88 11 44	2289	86 25 29	2300	84 39 30	2312
12	Sun	W.	71 43 58	2622	73 22 23	2635	75 0 31	2647	76 38 22	2660
	α Pegasi	W.	46 47 7	2580	48 26 29	2577	50 5 56	2574	51 45 27	2573
	Aldebaran	E.	33 0 26	2311	31 14 42	2325	29 29 19	2341	27 44 19	2357
	Jupiter	E.	45 39 19	2290	43 53 5	2302	42 7 9	2315	40 21 32	2328
	Pollux	E.	75 53 52	2373	74 9 39	2387	72 25 45	2400	70 42 10	2414
	Regulus	E.	112 29 20	2304	110 43 26	2315	108 57 49	2327	107 12 29	2338
13	Sun	W.	84 43 21	2724	86 19 29	2737	87 55 20	2750	89 30 54	2763
	α Pegasi	W.	60 2 42	2587	61 41 55	2593	63 21 0	2599	64 59 57	2606
	Jupiter	E.	31 38 16	2396	29 54 36	2411	28 11 17	2426	26 28 20	2442
	Pollux	E.	62 9 26	2489	60 27 58	2506	58 46 53	2522	57 6 10	2539

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	Regulus	E.	105° 27′ 25″	2350	103° 42′ 38″	2362	101° 58′ 8″	2373	100° 13′ 55″	2386
14	Sun	W.	91 6 10	2776	92 41 9	2780	94 15 51	2802	95 50 16	2816
	α Pegasi	W.	66 38 44	2613	68 17 22	2021	69 55 49	2629	71 34 5	2637
	α Arietis	W.	23 14 5	2785	24 48 52	2754	26 24 20	2731	28 0 19	2713
	Pollux	E.	55 25 51	2556	53 45 56	2574	52 6 26	2592	50 27 20	2611
	Regulus	E.	91 37 11	2445	89 54 41	2458	88 12 29	2470	86 30 34	2482
15	Sun	W.	103 38 8	2879	105 10 54	2892	106 43 23	2905	108 15 36	2916
	α Arietis	W.	36 4 19	2680	37 41 26	2679	39 18 34	2680	40 55 40	2683
	Saturn	W.	20 15 23	2551	21 55 26	2561	23 35 15	2570	25 14 51	2580
	Pollux	E.	42 18 44	2721	40 42 32	2746	39 6 53	2773	37 31 50	2802
	Regulus	E.	78 5 11	2542	76 24 56	2553	74 44 57	2565	73 5 14	2577
16	Sun	W.	115 52 50	2977	117 23 31	2989	118 53 57	3001	120 24 9	3013
	α Arietis	W.	49 0 0	2706	50 36 32	2712	52 12 56	2719	53 49 11	2725
	Saturn	W.	33 29 21	2632	35 7 33	2641	36 45 32	2652	38 23 17	2662
	Pollux	E.	29 47 14	2997	28 16 57	3051	26 47 47	3112	25 19 52	3184
	Regulus	E.	64 50 36	2634	63 12 27	2645	61 34 33	2656	59 56 54	2666
	Spica	E.	118 34 57	2610	116 56 15	2621	115 17 48	2631	113 39 35	2641
17	Sun	W.	127 51 34	3069	129 20 21	3081	130 48 54	3092	132 17 13	3103
	α Arietis	W.	61 48 12	2761	63 23 31	2768	64 58 41	2775	66 33 41	2783
	Saturn	W.	46 28 42	2710	48 5 9	2719	49 41 23	2728	51 17 25	2738
	Aldebaran	W.	28 16 26	2723	29 52 35	2730	31 28 35	2737	33 4 26	2744
	Jupiter	W.	15 34 43	2759	17 10 5	2757	18 45 29	2758	20 20 52	2761
	Regulus	E.	51 52 17	2722	50 16 6	2732	48 40 9	2744	47 4 27	2754
	Spica	E.	105 31 52	2690	103 54 59	2699	102 18 18	2708	100 41 49	2718
18	α Arietis	W.	74 26 10	2821	76 0 10	2829	77 34 0	2837	79 7 40	2845
	Saturn	W.	59 14 37	2782	60 49 29	2791	62 24 9	2798	63 58 39	2807
	Aldebaran	W.	41 1 22	2780	42 36 16	2787	44 11 1	2795	45 45 36	2801
	Jupiter	W.	28 16 25	2787	29 51 10	2794	31 25 46	2801	33 0 12	2808
	Regulus	E.	39 9 34	2811	37 35 21	2823	36 1 23	2836	34 27 42	2849
	Spica	E.	92 42 27	2762	91 7 9	2770	89 32 2	2778	87 57 6	2787
19	α Arietis	W.	86 53 32	2883	88 26 13	2891	89 58 44	2898	91 31 5	2905
	Saturn	W.	71 48 28	2848	73 21 54	2855	74 55 11	2862	76 28 18	2870
	Aldebaran	W.	53 36 9	2838	55 9 47	2845	56 43 16	2853	58 16 35	2861
	Jupiter	W.	40 50 7	2844	42 23 38	2851	43 57 0	2858	45 30 13	2865
	Spica	E.	80 5 6	2827	78 31 13	2835	76 57 30	2842	75 23 57	2849
20	α Arietis	W.	99 10 27	2944	100 41 50	2951	102 13 4	2959	103 44 8	2967
	Saturn	W.	84 11 28	2907	85 43 38	2914	87 15 39	2921	88 47 31	2927
	Aldebaran	W.	66 0 53	2895	67 33 18	2902	69 5 34	2909	70 37 42	2915
	Jupiter	W.	53 14 1	2901	54 46 19	2907	56 18 29	2914	57 50 30	2920
	Pollux	W.	25 39 16	3357	27 2 22	3317	28 26 14	3284	29 50 44	3257
	Spica	E.	67 38 33	2886	66 5 56	2893	64 33 28	2900	63 1 9	2907
	Antares	E.	113 2 19	2919	111 30 24	2926	109 58 38	2932	108 27 0	2938
21	Saturn	W.	96 24 42	2961	97 55 43	2968	99 26 36	2974	100 57 21	2981
	Aldebaran	W.	78 16 15	2947	79 47 34	2954	81 18 44	2961	82 49 46	2966
	Jupiter	W.	65 28 29	2954	66 59 39	2960	68 30 42	2966	70 1 37	2973

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
13	Regulus	E.	98° 30′ 0″	2398	96° 46′ 22″	2410	95° 3′ 1″	2421	93° 19′ 57″	2434
14	Sun	W.	97 24 23	2828	98 58 14	2841	100 31 48	2854	102 5 6	2866
	α Pegasi	W.	73 12 9	2646	74 50 1	2655	76 27 41	2664	78 5 9	2674
	α Arietis	W.	29 36 42	2700	31 13 22	2691	32 50 14	2685	34 27 14	2681
	Pollux	E.	48 48 40	2631	47 10 27	2652	45 32 43	2674	43 55 28	2697
	Regulus	E.	84 48 56	2494	83 7 35	2506	81 26 30	2518	79 45 42	2530
15	Sun	W.	109 47 34	2929	111 19 16	2941	112 50 43	2954	114 21 54	2965
	α Arietis	W.	42 32 43	2686	44 9 41	2690	45 46 34	2695	47 23 20	2700
	Saturn	W.	26 54 13	2590	28 33 21	2601	30 12 15	2611	31 50 55	2621
	Pollux	E.	35 57 25	2834	34 23 41	2869	32 50 42	2906	31 18 31	2949
	Regulus	E.	71 25 47	2588	69 46 36	2599	68 7 40	2611	66 29 0	2623
16	Sun	W.	121 54 6	3024	123 23 49	3035	124 53 18	3047	126 22 33	3058
	α Arietis	W.	55 25 18	2731	57 1 16	2739	58 37 4	2746	60 12 43	2753
	Saturn	W.	40 0 48	2672	41 38 6	2681	43 15 11	2691	44 52 3	2701
	Pollux	E.	23 53 24	3270	22 28 37	3372	21 5 48	3494	19 45 17	3645
	Regulus	E.	58 19 29	2677	56 42 19	2689	55 5 24	2699	53 28 43	2710
	Spica	E.	112 1 36	2651	110 23 50	2660	108 46 17	2671	107 8 58	2680
17	Sun	W.	133 45 19	3114	135 13 11	3125	136 40 50	3137	138 8 15	3148
	α Arietis	W.	68 8 31	2791	69 43 11	2798	71 17 41	2806	72 52 1	2814
	Saturn	W.	52 53 15	2747	54 28 53	2756	56 4 19	2764	57 39 34	2773
	Aldebaran	W.	34 40 8	2750	36 15 41	2758	37 51 4	2765	39 26 18	2772
	Jupiter	W.	21 56 11	2765	23 31 25	2770	25 6 32	2775	26 41 32	2781
	Regulus	E.	45 28 59	2766	43 53 46	2776	42 18 47	2788	40 44 3	2799
	Spica	E.	99 5 33	2727	97 29 29	2736	95 53 37	2744	94 17 56	2753
18	α Arietis	W.	80 41 10	2852	82 14 30	2860	83 47 40	2867	85 20 41	2875
	Saturn	W.	65 32 58	2815	67 7 6	2823	68 41 4	2831	70 14 51	2839
	Aldebaran	W.	47 20 2	2809	48 54 18	2816	50 28 25	2824	52 2 22	2831
	Jupiter	W.	34 34 29	2815	36 8 37	2822	37 42 36	2829	39 16 26	2836
	Regulus	E.	32 54 18	2863	31 21 12	2877	29 48 24	2892	28 15 55	2909
	Spica	E.	86 22 21	2795	84 47 47	2803	83 13 23	2811	81 39 9	2619
19	α Arietis	W.	93 3 17	2913	94 35 19	2921	96 7 11	2928	97 38 54	2936
	Saturn	W.	78 1 15	2878	79 34 2	2885	81 6 40	2892	82 39 9	2900
	Aldebaran	W.	59 49 44	2868	61 22 44	2874	62 55 36	2881	64 28 19	2888
	Jupiter	W.	47 3 17	2872	48 36 12	2879	50 8 58	2887	51 41 34	2894
	Spica	E.	73 50 33	2857	72 17 19	2864	70 44 14	2872	69 11 19	2879
20	α Arietis	W.	105 15 2	2975	106 45 46	2982	108 16 21	2990	109 46 46	2998
	Saturn	W.	90 19 15	2935	91 50 50	2942	93 22 16	2949	94 53 33	2955
	Aldebaran	W.	72 9 41	2922	73 41 32	2929	75 13 14	2935	76 44 48	2941
	Jupiter	W.	59 22 23	2927	60 54 7	2934	62 25 43	2941	63 57 10	2747
	Pollux	W.	31 15 46	3234	32 41 15	3214	34 7 7	3199	35 33 17	3187
	Spica	E.	61 28 59	2914	59 56 58	2920	58 25 5	2927	56 53 20	2934
	Antares	E.	106 55 30	2945	105 24 8	2951	103 52 54	2957	102 21 48	2963
21	Saturn	W.	102 27 57	2987	103 58 26	2993	105 28 47	2999	106 59 1	3005
	Aldebaran	W.	84 20 41	2973	85 51 28	2978	87 22 8	2985	88 52 40	2990
	Jupiter	W.	71 32 24	2979	73 3 3	2985	74 33 35	2991	76 3 59	2997

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Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
21	Pollux	W.	36° 59′ 42″	3176	38° 26′ 20″	3167	39° 53′ 9″	3159	41° 20′ 7″	3153
	Spica	E.	55 21 44	2940	53 50 16	2946	52 18 56	2953	50 47 44	2958
	Antares	E.	100 50 49	2969	99 19 58	2976	97 49 15	2981	96 18 39	2988
22	Aldebaran	W.	90 23 5	2996	91 53 23	3001	93 23 34	3006	94 53 39	3012
	Jupiter	W.	77 34 16	3002	79 4 26	3009	80 34 28	3014	82 4 23	3019
	Pollux	W.	48 36 17	3139	50 3 39	3138	51 31 3	3138	52 58 27	3138
	Spica	E.	43 13 37	2989	41 43 10	2993	40 12 49	2999	38 42 35	3004
	Antares	E.	88 47 33	3017	87 17 42	3022	85 47 57	3028	84 18 19	3034
23	Aldebaran	W.	102 22 25	3037	103 51 52	3041	105 21 14	3045	106 50 31	3050
	Jupiter	W.	89 32 24	3044	91 1 42	3049	92 30 54	3053	94 0 1	3058
	Pollux	W.	60 15 21	3142	61 42 40	3143	63 9 58	3144	64 37 14	3146
	Regulus	W.	23 13 14	3146	24 40 28	3138	26 7 52	3132	27 35 23	3127
	Spica	E.	31 13 1	3029	29 43 24	3034	28 13 53	3038	26 44 27	3042
	Antares	E.	76 51 50	3060	75 22 51	3064	73 53 58	3069	72 25 11	3074
	Venus	E.	117 4 21	3429	115 42 37	3433	114 20 58	3438	112 59 25	3443
24	Jupiter	W.	101 24 20	3076	102 52 59	3079	104 21 34	3082	105 50 6	3085
	Pollux	W.	71 53 6	3153	73 20 11	3155	74 47 14	3156	76 14 16	3157
	Regulus	W.	34 54 3	3116	36 21 53	3114	37 49 45	3113	39 17 39	3112
	Antares	E.	65 2 37	3095	63 34 21	3099	62 6 10	3102	60 38 3	3106
	Venus	E.	106 12 56	3463	104 51 51	3467	103 30 50	3471	102 9 53	3473
25	Jupiter	W.	113 12 1	3094	114 40 18	3095	116 8 34	3096	117 36 49	3096
	Pollux	W.	83 29 6	3162	84 56 1	3162	86 22 56	3162	87 49 51	3162
	Regulus	W.	46 37 17	3109	48 5 15	3109	49 33 14	3109	51 1 13	3107
	Antares	E.	53 18 31	3121	51 50 47	3124	50 23 7	3127	48 55 30	3128
	Venus	E.	95 25 50	3484	94 5 8	3485	92 44 27	3485	91 23 46	3485
	α Aquilæ	E.	104 34 40	3507	103 14 24	3503	101 54 3	3498	100 33 37	3495
	Sun	E.	141 45 11	3499	140 24 46	3497	139 4 19	3497	137 43 51	3495
26	Pollux	W.	95 4 29	3158	96 31 28	3157	97 58 28	3156	99 25 30	3153
	Regulus	W.	58 21 40	3097	59 49 53	3095	61 18 9	3092	62 46 28	3088
	Antares	E.	41 38 5	3140	40 10 44	3143	38 43 27	3146	37 16 13	3149
	Venus	E.	84 40 23	3484	83 19 41	3481	81 58 56	3479	80 38 8	3476
	α Aquilæ	E.	93 50 26	3478	92 29 37	3474	91 8 44	3472	89 47 48	3470
	Sun	E.	131 0 57	3483	129 40 14	3479	128 19 27	3477	126 58 37	3472
27	Pollux	W.	106 41 21	3141	108 8 41	3137	109 36 6	3134	111 3 35	3130
	Regulus	W.	70 9 15	3067	71 38 5	3061	73 7 2	3056	74 36 6	3050
	Spica	W.	16 13 11	3046	17 42 27	3041	19 11 49	3035	20 41 18	3030
	Antares	E.	30 1 7	3172	28 34 24	3179	27 7 50	3188	25 41 27	3900
	Venus	E.	73 53 17	3457	72 32 5	3453	71 10 48	3447	69 49 24	3441
	α Aquilæ	E.	83 2 30	3458	81 41 19	3456	80 20 6	3454	78 58 50	3453
	Sun	E.	120 13 13	3448	118 51 51	3442	117 30 22	3436	116 8 46	3429
28	Regulus	W.	82 3 27	3013	83 33 23	3005	85 3 30	2996	86 33 48	2986
	Spica	W.	28 10 42	2993	29 41 3	2985	31 11 34	2977	32 42 16	2967
	Venus	E.	63 0 35	3404	61 38 23	3395	60 16 1	3386	58 53 29	3376
	α Aquilæ	E.	72 12 11	3448	70 50 49	3448	69 29 27	3448	68 8 5	3449
	Sun	E.	109 18 40	3388	107 56 10	3378	106 33 29	3368	105 10 36	3358

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
21	Pollux	W.	42° 47′ 12″	3148	44° 14′ 23″	3145	45° 41′ 38″	3143	47° 8′ 56″	3140
	Spica	E.	49 16 39	2965	47 45 42	2971	46 14 53	2977	44 44 11	2983
	Antares	E.	94 48 11	2993	93 17 50	3000	91 47 37	3005	90 17 31	3012
22	Aldebaran	W.	96 23 37	3017	97 53 28	3022	99 23 13	3027	100 52 52	3032
	Jupiter	W.	83 34 12	3025	85 3 54	3030	86 33 30	3034	88 3 0	3039
	Pollux	W.	54 25 51	3138	55 53 15	3138	57 20 38	3139	58 48 0	3140
	Spica	E.	37 12 27	3009	35 42 26	3015	34 12 32	3020	32 42 44	3024
	Antares	E.	82 48 48	3039	81 19 24	3044	79 50 6	3050	78 20 55	3055
23	Aldebaran	W.	108 19 42	3054	109 48 48	3058	111 17 49	3061	112 46 46	3064
	JUPITER	W.	95 29 2	3062	96 57 58	3065	98 26 50	3069	99 55 37	3073
	Pollux	W.	66 4 28	3148	67 31 40	3149	68 58 50	3150	70 25 59	3152
	Regulus	W.	29 3 0	3123	30 30 42	3120	31 58 27	3119	33 26 14	3117
	Spica	E.	25 15 6	3046	23 45 50	3049	22 16 38	3052	20 47 30	3056
	Antares	E.	70 56 30	3078	69 27 54	3082	67 59 23	3087	66 30 57	3091
	VENUS	E.	111 37 57	3448	110 16 35	3453	108 55 18	3456	107 34 5	3460
24	JUPITER	W.	107 18 34	3087	108 46 59	3089	110 15 22	3091	111 43 42	3092
	Pollux	W.	77 41 17	3158	79 8 17	3159	80 35 15	3161	82 2 11	3162
	Regulus	W.	40 45 34	3112	42 13 29	3112	43 41 24	3111	45 9 20	3110
	Antares	E.	59 10 1	3109	57 42 3	3113	56 14 9	3115	54 46 18	3119
	VENUS	E.	100 48 59	3476	99 28 8	3479	98 7 20	3480	96 46 34	3482
25	JUPITER	W.	119 5 3	3096	120 33 17	3096	122 1 31	3096	123 29 46	3095
	Pollux	W.	89 16 45	3162	90 43 40	3162	92 10 35	3161	93 37 31	3159
	Regulus	W.	52 29 14	3105	53 57 17	3104	55 25 22	3101	56 53 30	3100
	Antares	E.	47 27 55	3131	46 0 23	3133	44 32 54	3136	43 5 28	3138
	VENUS	E.	90 3 5	3486	88 42 25	3486	87 21 45	3485	86 1 4	3485
	α Aquilæ	E.	99 13 7	3490	97 52 32	3488	96 31 54	3484	95 11 12	3480
	SUN	E.	136 23 21	3493	135 2 49	3490	133 42 14	3488	132 21 37	3486
26	Pollux	W.	100 52 35	3152	102 19 42	3149	103 46 52	3147	105 14 5	3144
	Regulus	W.	64 14 52	3085	65 43 20	3081	67 11 53	3077	68 40 31	3072
	Antares	E.	35 49 3	3152	34 21 57	3156	32 54 55	3160	31 27 58	3165
	VENUS	E.	79 17 17	3473	77 56 23	3471	76 35 26	3466	75 14 24	3462
	α Aquilæ	E.	88 26 50	3467	87 5 49	3464	85 44 45	3462	84 23 39	3460
	SUN	E.	125 37 42	3469	124 16 43	3464	122 55 39	3459	121 34 29	3454
27	Pollux	W.	112 31 8	3126	113 58 46	3122	115 26 29	3117	116 54 18	3113
	Regulus	W.	76 5 17	3043	77 34 36	3036	79 4 4	3029	80 33 41	3022
	Spica	W.	22 10 54	3023	23 40 38	3017	25 10 30	3009	26 40 31	3001
	Antares	E.	24 15 18	3215	22 49 27	3234	21 23 58	3258	19 58 57	3290
	VENUS	E.	68 27 54	3435	67 6 17	3428	65 44 32	3420	64 22 38	3412
	α Aquilæ	E.	77 37 33	3451	76 16 14	3550	74 54 54	3449	73 33 33	3448
	SUN	E.	114 47 2	3422	113 25 10	3415	112 3 10	3406	110 41 0	3397
28	Regulus	W.	88 4 18	2977	89 35 0	2967	91 5 54	2956	92 37 2	2945
	Spica	W.	34 13 10	2957	35 44 16	2947	37 15 35	2937	38 47 7	2926
	VENUS	E.	57 30 45	3365	56 7 49	3356	54 44 42	3345	53 21 23	3334
	α Aquilæ	E.	66 46 44	3451	65 25 25	3453	64 4 8	3455	62 42 54	3458
	SUN	E.	103 47 32	3347	102 24 15	3337	101 0 46	3325	99 37 3	3312

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	22 48 23.10	9.363	S. 7 35 47.0	+56.95	16 10.41	65.44	12 33.33	0.494
Frid.	2	22 52 7.55	9.342	7 12 56.6	57.23	16 10.17	65.36	12 21.25	0.514
Sat.	3	22 55 51.52	9.323	6 50 0.0	57.48	16 9.91	65.28	12 8.71	0.533
Sun.	4	22 59 35.03	9.305	6 26 57.6	+57.72	16 9.66	65.21	11 55.71	0.551
Mon.	5	23 3 18.10	9.287	6 3 49.8	57.93	16 9.40	65.15	11 42.26	0.569
Tues.	6	23 7 0.75	9.269	5 40 37.0	58.13	16 9.15	65.09	11 28.39	0.586
Wed.	7	23 10 42.98	9.251	5 17 19.5	+58.32	16 8.89	65.03	11 14.11	0.604
Thur.	8	23 14 24.82	9.235	4 53 57.9	58.48	16 8.63	64.97	10 59.44	0.620
Frid.	9	23 18 6.30	9.220	4 30 32.4	58.63	16 8.36	64.92	10 44.40	0.635
Sat.	10	23 21 47.41	9.206	4 7 3.6	+58.77	16 8.11	64.87	10 29.00	0.649
Sun.	11	23 25 28.18	9.192	3 43 31.9	58.88	16 7.85	64.82	10 13.26	0.663
Mon.	12	23 29 8.63	9.178	3 19 57.6	58.98	16 7.59	64.78	9 57.20	0.677
Tues.	13	23 32 48.76	9.165	2 56 21.0	+59.06	16 7.32	64.74	9 40.83	0.690
Wed.	14	23 36 28.60	9.154	2 32 42.5	59.13	16 7.07	64.70	9 24 15	0.701
Thur.	15	23 40 8.16	9.143	2 9 2.6	59.18	16 6.81	64.67	9 7.21	0.712
Frid.	16	23 43 47.47	9.133	1 45 21.6	+59.23	16 6.55	64.64	8 50.02	0.722
Sat.	17	23 47 26.55	9.124	1 21 39.9	59.24	16 6.28	64.61	8 32.60	0.731
Sun.	18	23 51 5.42	9.116	0 57 57.9	59.25	16 6.02	64.58	8 14.96	0.739
Mon.	19	23 54 44.09	9.108	0 34 15.8	+59.24	16 5.75	64.55	7 57.13	0.747
Tues.	20	23 58 22.60	9.101	S. 0 10 34.1	59.22	16 5.48	64.53	7 39.13	0.754
Wed.	21	0 2 0.96	9.096	N. 0 13 6.9	59.19	16 5.21	64.51	7 20.99	0.759
Thur.	22	0 5 39.21	9.091	0 36 46.8	+59.14	16 4.94	64.49	7 2.73	0.763
Frid.	23	0 9 17.35	9.087	1 0 25.4	59.08	16 4.66	64.48	6 44.38	0.767
Sat.	24	0 12 55.42	9.084	1 24 2.3	59.00	16 4.39	64 47	6 25.94	0.770
Sun.	25	0 16 33.44	9.083	1 47 37.2	+58.91	16 4.11	64.47	6 7.46	0.772
Mon.	26	0 20 11.44	9.083	2 11 9.7	58.81	16 3.83	64.46	5 48.96	0.772
Tues.	27	0 23 49.44	9.083	2 34 39.5	58.68	16 3.55	64.46	5 30.46	0.772
Wed.	28	0 27 27.45	9.084	2 58 6.2	+58.54	16 3.27	64.46	5 11.96	0.771
Thur.	29	0 31 5.51	9.087	3 21 29.4	58.40	16 2.98	64.47	4 53.53	0.768
Frid.	30	0 34 43.63	9.090	3 44 48.9	58.23	16 2.70	64.48	4 35.15	0.765
Sat.	31	0 38 21.84	9.094	4 8 4.3	58.05	16 2.42	64.49	4 16.86	0.761
Sun.	32	0 42 0.16	9.099	N. 4 31 15.3	+57.85	16 2.14	64.51	3 58.68	0.756

Note.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	22 48 21.14	9.363	S. 7 35 58.9	+56.96	12 33.43	0.494	22 35 47.71
Frid.	2	22 52 5.62	9.343	7 13 8.4	57.24	12 21.35	0.514	22 39 44.27
Sat.	3	22 55 49.63	9.324	6 50 11.6	57.49	12 8.81	0 533	22 43 40.82
Sun.	4	22 59 33.18	9.306	6 27 9.1	+57.73	11 55.81	0.551	22 47 37.37
Mon.	5	23 3 16.29	9.288	6 4 1.1	57.94	11 42.37	0.569	22 51 33.92
Tues.	6	23 6 58.98	9.271	5 40 48.1	58.14	11 28.50	0.586	22 55 30.48
Wed.	7	23 10 41.25	9.253	5 17 30.4	+58.33	11 14.22	0.604	22 59 27.03
Thur.	8	23 14 23.13	9.237	4 54 8.6	58.49	10 59.55	0.620	23 3 23.58
Frid.	9	23 18 4.65	9.222	4 30 42.9	58.64	10 44.52	0.635	23 7 20.13
Sat.	10	23 21 45.80	9.208	4 7 13.9	+58.78	10 29.11	0.649	23 11 16.69
Sun.	11	23 25 26.61	9.194	3 43 41.9	58.89	10 13.37	0.663	23 15 13.24
Mon.	12	23 29 7.10	9.180	3 20 7.3	58.99	9 57.31	0.677	23 19 9.79
Tues.	13	23 32 47.28	9.167	2 56 30.5	+59.08	9 40.94	0.690	23 23 6.34
Wed.	14	23 36 27.16	9.156	2 32 51.8	59.14	9 24.26	0.701	23 27 2.90
Thur.	15	23 40 6.77	9.145	2 9 11.6	59.19	9 7.32	0.712	23 30 59.45
Frid.	16	23 43 46.13	9.135	1 45 30.4	+59.24	8 50.13	0.722	23 34 56.00
Sat.	17	23 47 25.25	9.126	1 21 48.4	59.26	8 32.70	0.731	23 38 52.55
Sun.	18	23 51 4.16	9.118	0 58 6.1	59.26	8 15.06	0.739	23 42 49.10
Mon.	19	23 54 42.88	9.109	0 34 23.7	+59.25	7 57.23	0.747	23 46 45.65
Tues.	20	23 58 21.44	9.103	S. 0 10 41.7	59.24	7 39.23	0.754	23 50 42.21
Wed.	21	0 1 59.84	9.098	N. 0 12 59.5	59.20	7 21.08	0.759	23 54 38.76
Thur.	22	0 5 38.13	9.094	0 36 39.8	+59.15	7 2.82	0.763	23 58 35.31
Frid.	23	0 9 16.32	9.090	1 0 18.7	59.09	6 44.46	0.767	0 2 31.86
Sat.	24	0 12 54.44	9.087	1 23 55.9	59.01	6 26.02	0.770	0 6 28.42
Sun.	25	0 16 32.51	9.086	1 47 31.1	+58.92	6 7.54	0.772	0 10 24.97
Mon.	26	0 20 10.56	9.085	2 11 3.9	58.82	5 49.04	0.772	0 14 21.52
Tues.	27	0 23 48.60	9.085	2 34 34.0	58.69	5 30.53	0.772	0 18 18.07
Wed.	28	0 27 26.66	9.086	2 58 1.0	+58.55	5 12.03	0.771	0 22 14.63
Thur.	29	0 31 4.77	9.089	3 21 24.5	58.40	4 53.59	0.768	0 26 11.18
Frid.	30	0 34 42.94	9.092	3 44 44.4	58.24	4 35.21	0.765	0 30 7.73
Sat.	31	0 38 21.19	9.096	4 8 0.1	58.06	4 16.91	0.761	0 34 4.28
Sun.	32	0 41 59.56	9.101	N. 4 31 11.4	+57.86	3 58.72	0.756	0 38 0.84

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 Hour,
+ $9^s.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	60	340 35 49.7	35 28.2	150.42	+ 0.55	9.9962187	+ 46.6	1 23 58.50
2	61	341 35 59.1	35 37.5	150.36	0.66	9.9963309	47.0	1 20 2.59
3	62	342 36 6.9	35 45.2	150.29	0.76	9.9964440	47.3	1 16 6.68
4	63	343 36 13.1	35 51.3	150.22	+ 0.82	9.9965579	+ 47.6	1 12 10.77
5	64	344 36 17.6	35 55.8	150.15	0.86	9.9966724	47.8	1 8 14.87
6	65	345 36 20.5	35 58.6	150.08	0.86	9.9967875	48.0	1 4 18.96
7	66	346 36 21.7	35 59.7	150.01	+ 0.85	9.9969030	+ 48.2	1 0 23.05
8	67	347 36 21.0	35 58.9	149.93	0.80	9.9970188	48.3	1 56 27.15
9	68	348 36 18.4	35 56.2	149.85	0.72	9.9971348	48.4	0 52 31.25
10	69	349 36 13.9	35 51.6	149.77	+ 0.62	9.9972510	+ 48.5	0 48 35.34
11	70	350 36 7.3	35 45.0	149.68	0.52	9.9973674	48.6	0 44 39.43
12	71	351 35 58.6	35 36.2	149.59	0.39	9.9974840	48.7	0 40 43.52
13	72	352 35 47.8	35 25.3	149.50	+ 0.25	9.9976009	+ 48.8	0 36 47.62
14	73	353 35 34.8	35 12.2	149.41	+ 0.12	9.9977181	48.9	0 32 51.71
15	74	354 35 19.5	34 56.8	149.31	− 0.01	9.9978356	49.1	0 28 55.80
16	75	355 35 1.9	34 39.1	149.22	− 0.12	9.9979536	+ 49.3	0 24 59.90
17	76	356 34 42.0	34 19.1	149.12	0.21	9.9980722	49.6	0 21 3.99
18	77	357 34 19.8	33 56.8	149.03	0.27	9.9981915	49.9	0 17 8.08
19	78	358 33 55.4	33 32.3	148.93	− 0.29	9.9983115	+ 50.2	0 13 12.17
20	79	359 33 28.7	33 5.5	148.84	0.29	9.9984324	50.5	0 9 16.26
21	80	0 32 59.8	32 36.6	148.75	0.26	9.9985541	50.9	0 5 20.36
22	81	1 32 28.9	32 5.6	148.66	− 0.21	9.9986767	+ 51.2	0 1 24.45 23 57 28.54
23	82	2 31 55.8	31 32.4	148.58	0.12	9.9988001	51.6	23 53 32.63
24	83	3 31 20.6	30 57.1	148.49	− 0.02	9.9989244	51.9	23 49 36.74
25	84	4 30 43.5	30 19.9	148.41	+ 0.08	9.9990495	+ 52.3	23 45 40.83
26	85	5 30 4.4	29 40.8	148.33	0.21	9.9991754	52.6	23 41 44.92
27	86	6 29 23.4	28 59.7	148.25	0.35	9.9993020	52.9	23 37 49.02
28	87	7 28 40.6	28 16.8	148.17	+ 0.49	9.9994291	+ 53.1	23 33 53.12
29	88	8 27 56.0	27 32.1	148.10	0.60	9.9995566	53.3	23 29 57.21
30	89	9 27 9.6	26 45.6	148.03	0.70	9.9996844	53.3	23 26 1.30
31	90	10 26 21.4	25 57.4	147.96	0.77	9.9998124	53.3	23 22 5.39
32	91	11 25 31.5	25 7.4	147.89	+ 0.82	9.9999403	+ 53.2	23 18 9.48

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 4.1	15 9.3	55 11.3	+ 1.49	55 30.4	+ 1.68	18 3.1	2.11	21.7
2	15 15.1	15 21.5	55 51.7	1.87	56 15.1	2.03	18 54.7	2.19	22.7
3	15 28.4	15 35.7	56 40.4	2.17	57 7.3	2.29	19 47.9	2.25	23.7
4	15 43.3	15 51.2	57 35.3	+ 2.37	58 4.0	+ 2.41	20 42.2	2.27	24.7
5	15 59.0	16 6.8	58 33.0	2.39	59 1.5	2.32	21 37.0	2.28	25.7
6	16 14.3	16 21.2	59 28.9	2.21	59 54.5	2.03	22 31.8	2.28	26.7
7	16 27.5	16 32.9	60 17.6	+ 1.78	60 37.4	+ 1.49	23 26.7	2.29	27.7
8	16 37.3	16 40.5	60 53.4	1.15	61 5.1	+ 0.77	ó		28.7
9	16 42.4	16 42.9	61 12.1	+ 0.37	61 14.2	− 0.02	0 21.7	2.30	0.3
10	16 42.2	16 40.2	61 11.5	− 0.42	61 4.0	− 0.81	1 17.2	2.33	1.3
11	16 36.9	16 32.7	60 52.2	1.15	60 36.5	1.44	2 13.4	2.36	2.3
12	16 27.5	16 21.6	60 17.6	1.69	59 55.9	1.89	3 10.4	2.39	3.3
13	16 15.2	16 8.4	59 32.2	− 2.02	59 7.4	− 2.11	4 7.7	2.39	4.3
14	16 1.4	15 54.4	58 41.7	2.14	58 15.9	2.14	5 4.8	2.36	5.3
15	15 47.4	15 40.6	57 50.3	2.10	57 25.4	2.03	6 0.6	2.29	6.3
16	15 34.1	15 28.0	57 1.5	− 1.94	56 38.8	− 1.82	6 54.4	2.19	7.3
17	15 22.2	15 16.8	56 17.6	1.70	55 57.9	1.57	7 45.7	2.08	8.3
18	15 11.9	15 7.4	55 39.7	1.44	55 23.2	1.31	8 34.3	1.97	9.3
19	15 3.3	14 59.7	55 8.3	− 1.17	54 55.0	− 1.04	9 20.5	1.88	10.3
20	14 56.5	14 53.6	54 43.2	0.91	54 32.8	0.80	10 4.8	1.81	11.3
21	14 51.2	14 49.2	54 23.9	0.68	54 16.4	0.57	10 47.7	1.77	12.3
22	14 47.5	14 46.1	54 10.2	− 0.47	54 5.2	− 0.36	11 29.9	1.75	13.3
23	14 45.1	14 44.5	54 1.5	0.25	53 59.1	− 0.15	12 11.9	1.76	14.3
24	14 44.1	14 44.2	53 57.9	− 0.04	53 58.1	+ 0.07	12 54.5	1.79	15.3
25	14 44.6	14 45.4	53 59.6	+ 0.18	54 2.6	+ 0.31	13 38.0	1.84	16.3
26	14 46.6	14 48.3	54 7.0	0.44	54 13.1	0.57	14 22.9	1.91	17.3
27	14 50.4	14 53.0	54 20.8	0.72	54 30.3	0.87	15 9.5	1.98	18.3
28	14 56.0	14 59.7	54 41.6	+ 1.02	54 54.9	+ 1.19	15 57.9	2.05	19.3
29	15 3.8	15 8.5	55 10.1	1.36	55 27.4	1.52	16 47.9	2.11	20.3
30	15 13.7	15 19.5	55 46.6	1.68	56 7.8	1.84	17 39.2	2.16	21.3
31	15 25.8	15 32.5	56 30.8	1.98	56 55.4	2.12	18 31.3	2.18	22.3
32	15 39.6	15 47.0	57 21.5	+ 2.22	57 48.7	+ 2.30	19 23.9	2.20	23.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.					**SATURDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 2 33.27	2.1462	S. 19 0 48.7	3.432	0	17 49 11.11	2.2883	S. 19 52 25.2	1.456
1	16 4 42.14	2.1495	19 4 11.9	3.342	1	17 51 28.48	2.2906	19 50 54.5	1.568
2	16 6 51.21	2.1529	19 7 29.7	3.251	2	17 53 45.98	2.2928	19 49 17.1	1.680
3	16 9 0.49	2.1563	19 10 42.1	3.160	3	17 56 3.62	2.2951	19 47 32.9	1.792
4	16 11 9.97	2.1596	19 13 48.9	3.069	4	17 58 21.39	2.2973	19 45 42.0	1.904
5	16 13 19.65	2.1629	19 16 50.2	2.976	5	18 0 39.29	2.2995	19 43 44.4	2.016
6	16 15 29.52	2.1662	19 19 46.0	2.883	6	18 2 57.33	2.3017	19 41 40.1	2.128
7	16 17 39.59	2.1695	19 22 36.2	2.789	7	18 5 15.49	2.3037	19 39 29.0	2.242
8	16 19 49.86	2.1729	19 25 20.7	2.695	8	18 7 33.77	2.3058	19 37 11.1	2.355
9	16 22 0.34	2.1762	19 27 59.6	2.601	9	18 9 52.18	2.3078	19 34 46.4	2.469
10	16 24 11.01	2.1794	19 30 32.8	2.505	10	18 12 10.71	2.3097	19 32 14.8	2.582
11	16 26 21.87	2.1827	19 33 0.2	2.409	11	18 14 29.35	2.3117	19 29 36.5	2.695
12	16 28 32.93	2.1859	19 35 21.9	2.313	12	18 16 48.11	2.3136	19 26 51.4	2.808
13	16 30 44.18	2.1892	19 37 37.8	2.217	13	18 19 6.98	2.3154	19 23 59.5	2.922
14	16 32 55.63	2.1924	19 39 47.9	2.119	14	18 21 25.96	2.3172	19 21 0.7	3.037
15	16 35 7.27	2.1956	19 41 52.1	2.021	15	18 23 45.05	2.3191	19 17 55.1	3.151
16	16 37 19.10	2.1987	19 43 50.5	1.923	16	18 26 4.25	2.3209	19 14 42.6	3.265
17	16 39 31.12	2.2019	19 45 42.9	1.824	17	18 28 23.56	2.3226	19 11 23.3	3.378
18	16 41 43.33	2.2051	19 47 29.4	1.725	18	18 30 42.97	2.3242	19 7 57.2	3.492
19	16 43 55.73	2.2082	19 49 9.9	1.625	19	18 33 2.47	2.3258	19 4 24.2	3.607
20	16 46 8.32	2.2113	19 50 44.4	1.525	20	18 35 22.07	2.3275	19 0 44.3	3.722
21	16 48 21.09	2.2144	19 52 12.9	1.424	21	18 37 41.77	2.3291	18 56 57.6	3.836
22	16 50 34.05	2.2175	19 53 35.3	1.323	22	18 40 1.56	2.3306	18 53 4.0	3.950
23	16 52 47.19	2.2206	S. 19 54 51.6	1.222	23	18 42 21.44	2.3321	S. 18 49 3.6	4.064
	FRIDAY 2.					**SUNDAY 4.**			
0	16 55 0.52	2.2237	S. 19 56 1.9	1.120	0	18 44 41.41	2.3335	S. 18 44 56.3	4.179
1	16 57 14.03	2.2267	19 57 6.0	1.017	1	18 47 1.46	2.3349	18 40 42.1	4.293
2	16 59 27.72	2.2296	19 58 3.9	0.913	2	18 49 21.60	2.3363	18 36 21.1	4.408
3	17 1 41.58	2.2325	19 58 55.6	0.810	3	18 51 41.82	2.3377	18 31 53.2	4.522
4	17 3 55.62	2.2355	19 59 41.1	0.706	4	18 54 2.12	2.3390	18 27 18.5	4.635
5	17 6 9.84	2.2384	20 0 20.3	0.601	5	18 56 22.50	2.3402	18 22 37.0	4.749
6	17 8 24.23	2.2413	20 0 53.2	0.496	6	18 58 42.95	2.3415	18 17 48.6	4.863
7	17 10 38.80	2.2441	20 1 19.8	0.391	7	19 1 3.48	2.3427	18 12 53.4	4.977
8	17 12 53.53	2.2469	20 1 40.1	0.285	8	19 3 24.07	2.3438	18 7 51.4	5.090
9	17 15 8.43	2.2497	20 1 54.0	0.179	9	19 5 44.73	2.3449	18 2 42.6	5.204
10	17 17 23.50	2.2526	20 2 1.6	− 0.073	10	19 8 5.46	2.3460	17 57 26.9	5.317
11	17 19 38.74	2.2553	20 2 2.8	+ 0.034	11	19 10 26.25	2.3470	17 52 4.5	5.430
12	17 21 54.14	2.2580	20 1 57.5	0.142	12	19 12 47.10	2.3480	17 46 35.3	5.543
13	17 24 9.70	2.2607	20 1 45.8	0.249	13	19 15 8.01	2.3490	17 40 59.3	5.656
14	17 26 25.42	2.2634	20 1 27.6	0.357	14	19 17 28.98	2.3500	17 35 16.6	5.768
15	17 28 41.31	2.2661	20 1 2.9	0.466	15	19 19 50.01	2.3509	17 29 27.1	5.881
16	17 30 57.35	2.2687	20 0 31.7	0.574	16	19 22 11.09	2.3518	17 23 30.9	5.992
17	17 33 13.55	2.2712	19 59 54.0	0.683	17	19 24 32.23	2.3527	17 17 28.0	6.104
18	17 35 29.90	2.2737	19 59 9.7	0.793	18	19 26 53.42	2.3535	17 11 18.4	6.216
19	17 37 46.40	2.2762	19 58 18.8	0.903	19	19 29 14.65	2.3542	17 5 2.1	6.327
20	17 40 3.05	2.2787	19 57 21.3	1.013	20	19 31 35.92	2.3549	16 58 39.2	6.437
21	17 42 19.85	2.2812	19 56 17.3	1.123	21	19 33 57.24	2.3557	16 52 9.7	6.547
22	17 44 36.79	2.2836	19 55 6.6	1.234	22	19 36 18.60	2.3563	16 45 33.5	6.657
23	17 46 53.88	2.2860	19 53 49.2	1.345	23	19 38 40.00	2.3570	16 38 50.8	6.767
24	17 40 11.11	2.2883	S. 19 52 25.2	1.456	24	19 41 1.44	2.3577	S. 16 32 1.5	6.877

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 5.					WEDNESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 41 1.44	2.3577	S. 16 32 1.5	6.877	0	21 34 29.71	2.3652	S. 9 8 5.0	11.300
1	19 43 22.92	2.3583	16 25 5.6	6.985	1	21 36 51.62	2.3652	8 56 44.9	11.368
2	19 45 44.43	2.3588	16 18 3.3	7.092	2	21 39 13.53	2.3652	8 45 20.8	11.435
3	19 48 5.97	2.3593	16 10 54.5	7.200	3	21 41 35.45	2.3652	8 33 52.7	11.501
4	19 50 27.55	2.3599	16 3 39.3	7.307	4	21 43 57.36	2.3653	8 22 20.7	11.566
5	19 52 49.16	2.3604	15 56 17.6	7.415	5	21 46 19.28	2.3653	8 10 44.8	11.629
6	19 55 10.79	2.3608	15 48 49.5	7.522	6	21 48 41.20	2.3653	7 59 5.2	11.691
7	19 57 32.45	2.3613	15 41 15.0	7.627	7	21 51 3.12	2.3653	7 47 21.9	11.752
8	19 59 54.14	2.3617	15 33 34.2	7.732	8	21 53 25.04	2.3653	7 35 35.0	11.811
9	20 2 15.85	2.3620	15 25 47.1	7.837	9	21 55 46.96	2.3653	7 23 44.6	11.868
10	20 4 37.58	2.3623	15 17 53.8	7.941	10	21 58 8.88	2.3654	7 11 50.8	11.925
11	20 6 59.33	2.3627	15 9 54.2	8.045	11	22 0 30.81	2.3655	6 59 53.6	11.981
12	20 9 21.11	2.3631	15 1 48.4	8.147	12	22 2 52.74	2.3656	6 47 53.1	12.035
13	20 11 42.90	2.3633	14 53 36.5	8.249	13	22 5 14.68	2.3657	6 35 49.4	12.087
14	20 14 4.71	2.3636	14 45 18.5	8.351	14	22 7 36.62	2.3658	6 23 42.6	12.137
15	20 16 26.53	2.3638	14 36 54.3	8.453	15	22 9 58.57	2.3659	6 11 32.9	12.186
16	20 18 48.37	2.3641	14 28 24.1	8.553	16	22 12 20.53	2.3661	5 59 20.3	12.234
17	20 21 10.22	2.3643	14 19 47.9	8.653	17	22 14 42.50	2.3662	5 47 4.8	12.282
18	20 23 32.08	2.3644	14 11 5.8	8.752	18	22 17 4.47	2.3663	5 34 46.4	12.328
19	20 25 53.95	2.3646	14 2 17.7	8.850	19	22 19 26.45	2.3664	5 22 25.4	12.372
20	20 28 15.83	2.3647	13 53 23.8	8.947	20	22 21 48.44	2.3666	5 10 1.8	12.413
21	20 30 37.72	2.3649	13 44 24.1	9.043	21	22 24 10.45	2.3669	4 57 35.8	12.453
22	20 32 59.62	2.3651	13 35 18.6	9.140	22	22 26 32.47	2.3671	4 45 7.4	12.493
23	20 35 21.53	2.3652	S. 13 26 7.3	9.235	23	22 28 54.50	2.3673	S. 4 32 36.6	12.532
	TUESDAY 6.					THURSDAY 8.			
0	20 37 43.44	2.3652	S. 13 16 50.4	9.329	0	22 31 16.55	2.3676	S. 4 20 3.5	12.569
1	20 40 5.36	2.3653	13 7 27.8	9.423	1	22 33 38.61	2.3678	4 7 28.3	12.603
2	20 42 27.28	2.3654	12 57 59.6	9.515	2	22 36 0.69	2.3681	3 54 51.1	12.636
3	20 44 49.21	2.3655	12 48 26.0	9.606	3	22 38 22.79	2.3684	3 42 12.0	12.667
4	20 47 11.14	2.3655	12 38 46.9	9.697	4	22 40 44.90	2.3687	3 29 31.0	12.698
5	20 49 33.07	2.3655	12 29 2.3	9.787	5	22 43 7.03	2.3691	3 16 48.2	12.727
6	20 51 55.00	2.3655	12 19 12.4	9.876	6	22 45 29.19	2.3695	3 4 3.8	12.753
7	20 54 16.93	2.3655	12 9 17.2	9.964	7	22 47 51.37	2.3698	2 51 17.8	12.779
8	20 56 38.86	2.3656	11 59 16.7	10.051	8	22 50 13.57	2.3702	2 38 30.3	12.803
9	20 59 0.80	2.3657	11 49 11.0	10.138	9	22 52 35.79	2.3706	2 25 41.4	12.826
10	21 1 22.74	2.3657	11 39 0.2	10.223	10	22 54 58.04	2.3711	2 12 51.2	12.846
11	21 3 44.68	2.3656	11 28 44.3	10.308	11	22 57 20.32	2.3716	1 59 59.9	12.864
12	21 6 6.61	2.3656	11 18 23.3	10.391	12	22 59 42.63	2.3721	1 47 7.5	12.882
13	21 8 28.55	2.3656	11 7 57.4	10.472	13	23 2 4.97	2.3726	1 34 14.1	12.898
14	21 10 50.48	2.3655	10 57 26.6	10.553	14	23 4 27.34	2.3730	1 21 19.8	12.912
15	21 13 12.41	2.3655	10 46 51.0	10.632	15	23 6 49.73	2.3735	1 8 24.6	12.926
16	21 15 34.34	2.3655	10 36 10.7	10.711	16	23 9 12.16	2.3741	0 55 28.7	12.937
17	21 17 56.27	2.3654	10 25 25.7	10.788	17	23 11 34.62	2.3747	0 42 32.2	12.946
18	21 20 18.19	2.3654	10 14 36.1	10.865	18	23 13 57.12	2.3752	0 29 35.2	12.953
19	21 22 40.12	2.3654	10 3 41.9	10.941	19	23 16 19.65	2.3758	0 16 37.8	12.959
20	21 25 2.04	2.3653	9 52 43.2	11.015	20	23 18 42.22	2.3765	S. 0 3 40.1	12.964
21	21 27 23.96	2.3653	9 41 40.1	11.088	21	23 21 4.83	2.3772	N. 0 9 17.9	12.967
22	21 29 45.88	2.3653	9 30 32.6	11.160	22	23 23 27.48	2.3778	0 22 16.0	12.968
23	21 32 7.80	2.3652	9 19 20.9	11.230	23	23 25 50.17	2.3786	0 35 14.1	12.967
24	21 34 29.71	2.3652	S. 9 8 5.0	11.300	24	23 28 12.91	2.3793	N. 0 48 12.1	12.965

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 9.					**SUNDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 28 12.91	2.3793	N. 0 48 12.1	12.965	0	1 23 34.15	2.4313	N.10 36 54.0	10.958
1	23 30 35.69	2.3800	1 1 9.9	12.962	1	1 26 0.07	2.4326	10 47 49.2	10.880
2	23 32 58.51	2.3808	1 14 7.5	12.957	2	1 28 26.06	2.4338	10 58 39.6	10.799
3	23 35 21.38	2.3816	1 27 4.7	12.949	3	1 30 52.12	2.4349	11 9 25.1	10.718
4	23 37 44.30	2.3824	1 40 1.4	12.940	4	1 33 18.25	2.4361	11 20 5.7	10.636
5	23 40 7.27	2.3832	1 52 57.5	12.929	5	1 35 44.45	2.4373	11 30 41.4	10.552
6	23 42 30.28	2.3840	2 5 52.9	12.917	6	1 38 10.73	2.4385	11 41 12.0	10.467
7	23 44 53.35	2.3849	2 18 47.5	12.903	7	1 40 37.07	2.4396	11 51 37.4	10.380
8	23 47 16.47	2.3857	2 31 41.3	12.888	8	1 43 3.48	2.4407	12 1 57.6	10.293
9	23 49 39.64	2.3866	2 44 34.1	12.871	9	1 45 29.96	2.4419	12 12 12.6	10.205
10	23 52 2.86	2.3875	2 57 25.8	12.852	10	1 47 56.51	2.4430	12 22 22.2	10.115
11	23 54 26.14	2.3885	3 10 16.3	12.832	11	1 50 23.12	2.4441	12 32 26.4	10.023
12	23 56 49.48	2.3895	3 23 5.6	12.810	12	1 52 49.80	2.4452	12 42 25.0	9.930
13	23 59 12.88	2.3904	3 35 53.5	12.786	13	1 55 16.54	2.4462	12 52 18.0	9.837
14	0 1 36.33	2.3913	3 48 39.9	12.760	14	1 57 43.35	2.4473	13 2 5.4	9.743
15	0 3 59.84	2.3923	4 1 24.7	12.733	15	2 0 10.22	2.4483	13 11 47.2	9.648
16	0 6 23.41	2.3934	4 14 7.9	12.705	16	2 2 37.15	2.4492	13 21 23.2	9.551
17	0 8 47.05	2.3945	4 26 49.3	12.674	17	2 5 4.13	2.4502	13 30 53.3	9.453
18	0 11 10.75	2.3955	4 39 28.8	12.642	18	2 7 31.17	2.4512	13 40 17.5	9.354
19	0 13 34.51	2.3966	4 52 6.4	12.609	19	2 9 58.27	2.4521	13 49 35.8	9.254
20	0 15 58.34	2.3977	5 4 41.9	12.573	20	2 12 25.42	2.4530	13 58 48.0	9.152
21	0 18 22.23	2.3987	5 17 15.2	12.537	21	2 14 52.63	2.4539	14 7 54.1	9.050
22	0 20 46.19	2.3999	5 29 46.3	12.498	22	2 17 19.89	2.4547	14 16 54.0	8.947
23	0 23 10.22	2.4010	N. 5 42 15.0	12.457	23	2 19 47.20	2.4555	N.14 25 47.8	8.844
	SATURDAY 10.					**MONDAY 12.**			
0	0 25 34.31	2.4021	N. 5 54 41.2	12.416	0	2 22 14.55	2.4562	N.14 34 35.3	8.739
1	0 27 58.47	2.4032	6 7 4.9	12.373	1	2 24 41.95	2.4570	14 43 16.5	8.633
2	0 30 22.70	2.4044	6 19 26.0	12.328	2	2 27 9.39	2.4577	14 51 51.3	8.527
3	0 32 47.00	2.4056	6 31 44.3	12.282	3	2 29 36.88	2.4585	15 0 19.7	8.419
4	0 35 11.38	2.4068	6 43 59.8	12.234	4	2 32 4.41	2.4591	15 8 41.6	8.311
5	0 37 35.82	2.4079	6 56 12.4	12.184	5	2 34 31.97	2.4597	15 16 57.0	8.202
6	0 40 0.33	2.4091	7 8 21.9	12.133	6	2 36 59.57	2.4602	15 25 5.8	8.092
7	0 42 24.91	2.4103	7 20 28.3	12.081	7	2 39 27.20	2.4607	15 33 8.0	7.981
8	0 44 49.57	2.4116	7 32 31.6	12.027	8	2 41 54.86	2.4613	15 41 3.5	7.869
9	0 47 14.30	2.4128	7 44 31.5	11.970	9	2 44 22.56	2.4618	15 48 52.3	7.756
10	0 49 39.10	2.4140	7 56 28.0	11.913	10	2 46 50.28	2.4622	15 56 34.3	7.643
11	0 52 3.98	2.4152	8 8 21.1	11.855	11	2 49 18.02	2.4625	16 4 9.5	7.530
12	0 54 28.93	2.4165	8 20 10.6	11.794	12	2 51 45.78	2.4628	16 11 37.9	7.416
13	0 56 53.96	2.4177	8 31 56.4	11.732	13	2 54 13.56	2.4632	16 18 59.4	7.300
14	0 59 19.06	2.4189	8 43 38.5	11.670	14	2 56 41.36	2.4635	16 26 13.9	7.184
15	1 1 44.23	2.4202	8 55 16.8	11.605	15	2 59 9.18	2.4637	16 33 21.5	7.068
16	1 4 9.48	2.4214	9 6 51.1	11.538	16	3 1 37.01	2.4638	16 40 22.1	6.951
17	1 6 34.80	2.4227	9 18 21.4	11.471	17	3 4 4.84	2.4639	16 47 15.6	6.833
18	1 9 0.20	2.4239	9 29 47.6	11.402	18	3 6 32.68	2.4641	16 54 2.0	6.714
19	1 11 25.67	2.4252	9 41 9.6	11.332	19	3 9 0.53	2.4641	17 0 41.3	6.595
20	1 13 51.22	2.4264	9 52 27.4	11.260	20	3 11 28.37	2.4640	17 7 13.4	6.476
21	1 16 16.84	2.4277	10 3 40.8	11.187	21	3 13 56.21	2.4639	17 13 38.4	6.357
22	1 18 42.54	2.4289	10 14 49.8	11.112	22	3 16 24.04	2.4638	17 19 56.2	6.236
23	1 21 8.31	2.4301	10 25 54.2	11.035	23	3 18 51.86	2.4637	17 26 6.7	6.115
24	1 23 34.15	2.4313	N.10 36 54.0	10.958	24	3 21 19.68	2.4635	N.17 32 10.0	5.994

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff for 1 Minute.
	TUESDAY 13.					THURSDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 21 19.68	2.4635	N.17 32 10.0	5.994	0	5 18 15.91	2.3872	N.19 56 31.5	+ 0.038
1	3 23 47.48	2.4632	17 38 6.0	5.872	1	5 20 39.05	2.3842	19 56 30.2	− 0.081
2	3 26 15.26	2.4628	17 43 54.7	5.750	2	5 23 2.02	2.3813	19 56 21.8	0.200
3	3 28 43.02	2.4625	17 49 36.0	5.627	3	5 25 24.81	2.3783	19 56 6.2	0.319
4	3 31 10.76	2.4621	17 55 9.9	5.504	4	5 27 47.41	2.3752	19 55 43.5	0.437
5	3 33 38.47	2.4616	18 0 36.5	5.381	5	5 30 9.83	2.3721	19 55 13.8	0.554
6	3 36 6.15	2.4610	18 5 55.7	5.258	6	5 32 32.06	2.3689	19 54 37.0	0.671
7	3 38 33.79	2.4604	18 11 7.5	5.134	7	5 34 54.10	2.3657	19 53 53.2	0.788
8	3 41 1.40	2.4598	18 16 11.8	5.010	8	5 37 15.94	2.3624	19 53 2.4	0.904
9	3 43 28.97	2.4591	18 21 8.7	4.886	9	5 39 37.59	2.3592	19 52 4.7	1.019
10	3 45 56.49	2.4583	18 25 58.1	4.761	10	5 41 59.04	2.3558	19 51 0.1	1.134
11	3 48 23.96	2.4575	18 30 40.0	4.636	11	5 44 20.29	2.3524	19 49 48.6	1.248
12	3 50 51.39	2.4567	18 35 14.4	4.511	12	5 46 41.33	2.3489	19 48 30.3	1.362
13	3 53 18.76	2.4557	18 39 41.3	4.386	13	5 49 2.16	2.3455	19 47 5.2	1.475
14	3 55 46.07	2.4547	18 44 0.7	4.261	14	5 51 22.79	2.3421	19 45 33.3	1.588
15	3 58 13.32	2.4537	18 48 12.6	4.135	15	5 53 43.21	2.3386	19 43 54.6	1.701
16	4 0 40.51	2.4526	18 52 16.9	4.009	16	5 56 3.42	2.3350	19 42 9.2	1.812
17	4 3 7.63	2.4514	18 56 13.7	3.884	17	5 58 23.41	2.3314	19 40 17.2	1.923
18	4 5 34.68	2.4502	19 0 3.0	3.758	18	6 0 43.18	2.3278	19 38 18.5	2.033
19	4 8 1.66	2.4490	19 3 44.7	3.632	19	6 3 2.74	2.3241	19 36 13.2	2.142
20	4 10 28.56	2.4476	19 7 18.9	3.506	20	6 5 22.07	2.3204	19 34 1.4	2.251
21	4 12 55.37	2.4462	19 10 45.5	3.380	21	6 7 41.18	2.3167	19 31 43.1	2.359
22	4 15 22.10	2.4447	19 14 4.5	3.254	22	6 10 0.07	2.3129	19 29 18.3	2.467
23	4 17 48.74	2.4432	N.19 17 16.0	3.129	23	6 12 18.73	2.3091	N.19 26 47.0	2.575
	WEDNESDAY 14.					FRIDAY 16.			
0	4 20 15.29	2.4416	N.19 20 20.0	3.003	0	6 14 37.16	2.3052	N.19 24 9.3	2.682
1	4 22 41.74	2.4400	19 23 16.4	2.877	1	6 16 55.36	2.3014	19 21 25.2	2.787
2	4 25 8.09	2.4384	19 26 5.3	2.752	2	6 19 13.33	2.2976	19 18 34.9	2.891
3	4 27 34.35	2.4367	19 28 46.6	2.626	3	6 21 31.07	2.2937	19 15 38.3	2.995
4	4 30 0.50	2.4349	19 31 20.4	2.500	4	6 23 48.57	2.2897	19 12 35.5	3.099
5	4 32 26.54	2.4330	19 33 46.6	2.374	5	6 26 5.84	2.2858	19 9 26.5	3.202
6	4 34 52.46	2.4310	19 36 5.3	2.249	6	6 28 22.87	2.2818	19 6 11.3	3.304
7	4 37 18.26	2.4291	19 38 16.5	2.124	7	6 30 39.66	2.2778	19 2 50.0	3.405
8	4 39 43.95	2.4272	19 40 20.2	1.999	8	6 32 56.21	2.2738	18 59 22.7	3.506
9	4 42 9.52	2.4251	19 42 16.4	1.874	9	6 35 12.52	2.2698	18 55 49.3	3.606
10	4 44 34.96	2.4228	19 44 5.1	1.750	10	6 37 28.59	2.2657	18 52 10.0	3.705
11	4 47 0.26	2.4206	19 45 46.4	1.626	11	6 39 44.41	2.2617	18 48 24.7	3.804
12	4 49 25.43	2.4184	19 47 20.2	1.502	12	6 41 59.99	2.2577	18 44 33.5	3.902
13	4 51 50.47	2.4161	19 48 46.6	1.378	13	6 44 15.33	2.2536	18 40 36.5	3.999
14	4 54 15.36	2.4137	19 50 5.6	1.254	14	6 46 30.42	2.2494	18 36 33.7	4.095
15	4 56 40.11	2.4113	19 51 17.1	1.131	15	6 48 45.26	2.2453	18 32 25.1	4.191
16	4 59 4.72	2.4089	19 52 21.3	1.008	16	6 50 59.85	2.2412	18 28 10.8	4.285
17	5 1 29.18	2.4063	19 53 18.1	0.886	17	6 53 14.20	2.2371	18 23 50.9	4.378
18	5 3 53.48	2.4037	19 54 7.6	0.763	18	6 55 28.30	2.2329	18 19 25.4	4.472
19	5 6 17.63	2.4011	19 54 49.7	0.642	19	6 57 42.15	2.2287	18 14 54.3	4.564
20	5 8 41.62	2.3984	19 55 24.6	0.521	20	6 59 55.75	2.2246	18 10 17.7	4.656
21	5 11 5.44	2.3957	19 55 52.2	0.399	21	7 2 9.10	2.2204	18 5 35.6	4.747
22	5 13 29.10	2.3929	19 56 12.5	0.278	22	7 4 22.20	2.2162	18 0 48.0	4.837
23	5 15 52.59	2.3901	19 56 25.6	0.158	23	7 6 35.05	2.2120	17 55 55.1	4.926
24	5 18 15.91	2.3872	N.19 56 31.5	+ 0.038	24	7 8 47.64	2.2078	N.17 50 56.9	5.014

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 17.					MONDAY 19.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 8 47.64	2.2078	N.17 50 56.9	5.014	0	8 50 5.22	2.0192	N.12 23 15.0	8.336
1	7 10 59.98	2.2036	17 45 53.4	5.102	1	8 52 6.27	2.0157	12 14 53.3	8.387
2	7 13 12.07	2.1995	17 40 44.6	5.190	2	8 54 7.11	2.0123	12 6 28.6	8.436
3	7 15 23.92	2.1953	17 35 30.6	5.277	3	8 56 7.75	2.0090	11 58 1.0	8.484
4	7 17 35.51	2.1911	17 30 11.4	5.362	4	8 58 8.19	2.0057	11 49 30.5	8.532
5	7 19 46.85	2.1869	17 24 47.2	5.446	5	9 0 8.44	2.0025	11 40 57.2	8.579
6	7 21 57.94	2.1828	17 19 17.9	5.530	6	9 2 8.49	1.9993	11 32 21.0	8.626
7	7 24 8.78	2.1786	17 13 43.6	5.613	7	9 4 8.35	1.9961	11 23 42.1	8.671
8	7 26 19.37	2.1744	17 8 4.4	5.695	8	9 6 8.02	1.9929	11 15 0.5	8.716
9	7 28 29.70	2.1702	17 2 20.2	5.777	9	9 8 7.50	1.9897	11 6 16.2	8.761
10	7 30 39.79	2.1661	16 56 31.1	5.857	10	9 10 6.79	1.9866	10 57 29.2	8.804
11	7 32 49.63	2.1618	16 50 37.3	5.937	11	9 12 5.89	1.9835	10 48 39.7	8.846
12	7 34 59.21	2.1576	16 44 38.7	6.017	12	9 14 4.81	1.9805	10 39 47.7	8.887
13	7 37 8.54	2.1535	16 38 35.3	6.095	13	9 16 3.55	1.9775	10 30 53.2	8.929
14	7 39 17.63	2.1494	16 32 27.3	6.172	14	9 18 2.11	1.9746	10 21 56.2	8.970
15	7 41 26.47	2.1453	16 26 14.7	6.248	15	9 20 0.50	1.9717	10 12 56.8	9.010
16	7 43 35.06	2.1412	16 19 57.5	6.324	16	9 21 58.72	1.9688	10 3 55.0	9.049
17	7 45 43.41	2.1371	16 13 35.8	6.399	17	9 23 56.76	1.9659	9 54 50.9	9.087
18	7 47 51.51	2.1329	16 7 9.6	6.473	18	9 25 54.63	1.9631	9 45 44.6	9.124
19	7 49 59.36	2.1288	16 0 39.0	6.547	19	9 27 52.33	1.9603	9 36 36.0	9.161
20	7 52 6.97	2.1247	15 54 4.0	6.620	20	9 29 49.87	1.9576	9 27 25.2	9.197
21	7 54 14.33	2.1207	15 47 24.6	6.692	21	9 31 47.25	1.9549	9 18 12.3	9.233
22	7 56 21.45	2.1167	15 40 40.9	6.763	22	9 33 44.46	1.9522	9 8 57.2	9.268
23	7 58 28.33	2.1127	N.15 33 53.0	6.833	23	9 35 41.52	1.9497	N. 8 59 40.1	9.302
SUNDAY 18.					TUESDAY 20.				
0	8 0 34.97	2.1087	N.15 27 0.9	6.903	0	9 37 38.42	1.9471	N. 8 50 21.0	9.335
1	8 2 41.37	2.1047	15 20 4.6	6.971	1	9 39 35.17	1.9445	8 40 59.9	9.367
2	8 4 47.53	2.1007	15 13 4.3	7.039	2	9 41 31.76	1.9419	8 31 36.9	9.400
3	8 6 53.45	2.0967	15 5 59.9	7.106	3	9 43 28.20	1.9395	8 22 11.9	9.432
4	8 8 59.14	2.0928	14 58 51.5	7.172	4	9 45 24.50	1.9371	8 12 45.1	9.462
5	8 11 4.59	2.0888	14 51 39.2	7.238	5	9 47 20.65	1.9347	8 3 16.5	9.491
6	8 13 9.80	2.0849	14 44 22.9	7.303	6	9 49 16.66	1.9323	7 53 46.2	9.520
7	8 15 14.78	2.0811	14 37 2.8	7.367	7	9 51 12.53	1.9300	7 44 14.1	9.548
8	8 17 19.53	2.0772	14 29 38.9	7.430	8	9 53 8.26	1.9277	7 34 40.4	9.576
9	8 19 24.05	2.0734	14 22 11.2	7.493	9	9 55 3.85	1.9254	7 25 5.0	9.603
10	8 21 28.34	2.0696	14 14 39.7	7.555	10	9 56 59.31	1.9233	7 15 28.0	9.630
11	8 23 32.40	2.0658	14 7 4.6	7.615	11	9 58 54.64	1.9212	7 5 49.4	9.656
12	8 25 36.24	2.0621	13 59 25.9	7.675	12	10 0 49.85	1.9191	6 56 9 3	9.680
13	8 27 39.85	2.0583	13 51 43.6	7.734	13	10 2 44.93	1.9169	6 46 27.8	9.704
14	8 29 43.24	2.0547	13 43 57.8	7.793	14	10 4 39.88	1.9148	6 36 44.8	9.728
15	8 31 46.41	2.0510	13 36 8.4	7.851	15	10 6 34.71	1.9129	6 27 0.4	9.752
16	8 33 49.36	2.0473	13 28 15.6	7.908	16	10 8 29.43	1.9110	6 17 14.6	9.774
17	8 35 52.09	2.0437	13 20 19.4	7.964	17	10 10 24.03	1.9090	6 7 27.5	9.795
18	8 37 54.60	2.0401	13 12 19.9	8.019	18	10 12 18.51	1.9071	5 57 39.2	9.816
19	8 39 56.90	2.0365	13 4 17.1	8.074	19	10 14 12.88	1.9052	5 47 49.6	9.837
20	8 41 58.98	2.0329	12 56 11.0	8.128	20	10 16 7.14	1.9035	5 37 58.8	9.856
21	8 44 0.85	2.0294	12 48 1.7	8.182	21	10 18 1.30	1.9017	5 28 6.9	9.874
22	8 46 2.51	2.0260	12 39 49.2	8.234	22	10 19 55.35	1.9000	5 18 13.9	9.893
23	8 48 3.97	2.0226	12 31 33.6	8.285	23	10 21 49.30	1.8983	5 8 19.8	9.911
24	8 50 5.22	2.0192	N.12 23 15.0	8.336	24	10 23 43.15	1.8967	N. 4 58 24.6	9.928

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 21.					**FRIDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 23 43.15	1.8967	N. 4 58 24.6	9.928	0	11 53 39.01	1.8658	S. 3 5 14.4	9.981
1	10 25 36.90	1.8951	4 48 28.4	9.944	1	11 55 30.97	1.8662	3 15 12.8	9.966
2	10 27 30.56	1.8936	4 38 31.3	9.959	2	11 57 22.96	1.8667	3 25 10.3	9.951
3	10 29 24.13	1.8921	4 28 33.3	9.974	3	11 59 14.97	1.8671	3 35 6.9	9.936
4	10 31 17.61	1.8906	4 18 34.4	9.988	4	12 1 7.01	1.8676	3 45 2.6	9.919
5	10 33 11.00	1.8891	4 8 34.7	10.002	5	12 2 59.08	1.8680	3 54 57.2	9.902
6	10 35 4.30	1.8877	3 58 34.2	10.015	6	12 4 51.17	1.8685	4 4 50.8	9.885
7	10 36 57.52	1.8863	3 48 32.9	10.027	7	12 6 43.30	1.8691	4 14 43.4	9.867
8	10 38 50.66	1.8851	3 38 30.9	10.039	8	12 8 35.46	1.8697	4 24 34.9	9.848
9	10 40 43.73	1.8838	3 28 28.2	10.050	9	12 10 27.66	1.8703	4 34 25.2	9.828
10	10 42 36.72	1.8826	3 18 24.9	10.060	10	12 12 19.90	1.8710	4 44 14.3	9.808
11	10 44 29.64	1.8814	3 8 21.0	10.070	11	12 14 12.18	1.8717	4 54 2.2	9.788
12	10 46 22.49	1.8803	2 58 16.5	10.079	12	12 16 4.51	1.8725	5 3 48.9	9.767
13	10 48 15.27	1.8792	2 48 11.5	10.087	13	12 17 56.88	1.8732	5 13 34.3	9.746
14	10 50 7.99	1.8781	2 38 6.0	10.095	14	12 19 49.30	1.8741	5 23 18.4	9.723
15	10 52 0.64	1.8770	2 28 0.1	10.102	15	12 21 41.77	1.8749	5 33 1.1	9.700
16	10 53 53.23	1.8761	2 17 53.8	10.108	16	12 23 34.29	1.8757	5 42 42.4	9.677
17	10 55 45.77	1.8752	2 7 47.1	10.114	17	12 25 26.86	1.8767	5 52 22.3	9.653
18	10 57 38.25	1.8743	1 57 40.1	10.119	18	12 27 19.49	1.8777	6 2 0.8	9.628
19	10 59 30.68	1.8734	1 47 32.8	10.123	19	12 29 12.18	1.8787	6 11 37.7	9.602
20	11 1 23.06	1.8725	1 37 25.3	10.127	20	12 31 4.93	1.8797	6 21 13.1	9.576
21	11 3 15.38	1.8717	1 27 17.5	10.131	21	12 32 57.74	1.8807	6 30 46.9	9.550
22	11 5 7.66	1.8710	1 17 9.6	10.134	22	12 34 50.62	1.8818	6 40 19.1	9.522
23	11 6 59.90	1.8703	N. 1 7 1.5	10.136	23	12 36 43.56	1.8829	S. 6 49 49.6	9.494
	THURSDAY 22.					**SATURDAY 24.**			
0	11 8 52.10	1.8697	N. 0 56 53.3	10.137	0	12 38 36.57	1.8841	S. 6 59 18.4	9.466
1	11 10 44.26	1.8691	0 46 45.1	10.137	1	12 40 29.65	1.8853	7 8 45.5	9.437
2	11 12 36.39	1.8685	0 36 36.9	10.137	2	12 42 22.81	1.8866	7 18 10.8	9.407
3	11 14 28.48	1.8679	0 26 28.6	10.137	3	12 44 16.04	1.8878	7 27 34.4	9.377
4	11 16 20.54	1.8674	0 16 20.4	10.136	4	12 46 9.35	1.8892	7 36 56.1	9.346
5	11 18 12.57	1.8670	N. 0 6 12.3	10.134	5	12 48 2.74	1.8905	7 46 15.9	9.314
6	11 20 4.58	1.8666	S. 0 3 55.7	10.132	6	12 49 56.21	1.8918	7 55 33.8	9.282
7	11 21 56.57	1.8662	0 14 3.5	10.128	7	12 51 49.76	1.8932	8 4 49.7	9.249
8	11 23 48.53	1.8659	0 24 11.1	10.125	8	12 53 43.40	1.8947	8 14 3.6	9.216
9	11 25 40.47	1.8656	0 34 18.5	10.121	9	12 55 37.13	1.8962	8 23 15.6	9.182
10	11 27 32.40	1.8654	0 44 25.6	10.116	10	12 57 30.94	1.8976	8 32 25.5	9.147
11	11 29 24.32	1.8651	0 54 32.4	10.110	11	12 59 24.84	1.8992	8 41 33.3	9.112
12	11 31 16.22	1.8649	1 4 38.8	10.103	12	13 1 18.84	1.9007	8 50 38.9	9.076
13	11 33 8.11	1.8648	1 14 44.8	10.097	13	13 3 12.93	1.9023	8 59 42.4	9.040
14	11 35 0.00	1.8648	1 24 50.4	10.089	14	13 5 7.12	1.9039	9 8 43.7	9.002
15	11 36 51.89	1.8647	1 34 55.5	10.081	15	13 7 1.40	1.9055	9 17 42.7	8.964
16	11 38 43.77	1.8647	1 45 0.1	10.072	16	13 8 55.78	1.9072	9 26 39.4	8.926
17	11 40 35.65	1.8647	1 55 4.2	10.063	17	13 10 50.27	1.9090	9 35 33.8	8.887
18	11 42 27.53	1.8648	2 5 7.7	10.053	18	13 12 44.86	1.9107	9 44 25.9	8.848
19	11 44 19.42	1.8649	2 15 10.6	10.042	19	13 14 39.56	1.9125	9 53 15.6	8.808
20	11 46 11.32	1.8650	2 25 12.8	10.031	20	13 16 34.36	1.9143	10 2 2.8	8.767
21	11 48 3.22	1.8652	2 35 14.3	10.019	21	13 18 29.27	1.9161	10 10 47.6	8.726
22	11 49 55.14	1.8654	2 45 15.1	10.007	22	13 20 24.29	1.9179	10 19 29.9	8.684
23	11 51 47.07	1.8656	2 55 15.1	9.994	23	13 22 19.42	1.9198	10 28 9.7	8.642
24	11 53 39.01	1.8658	S. 3 5 14.4	9.981	24	13 24 14.67	1.9217	S. 10 36 46.9	8.598

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	13 24 14.67	1.9217	S. 10 36 46.9	8.598
1	13 26 10.03	1.9237	10 45 21.5	8.554
2	13 28 5.51	1.9257	10 53 53.4	8.510
3	13 30 1.11	1.9277	11 2 22.7	8.466
4	13 31 56.83	1.9297	11 10 49.3	8.420
5	13 33 52.67	1.9317	11 19 13.1	8.373
6	13 35 48.63	1.9337	11 27 34.0	8.325
7	13 37 44.72	1.9358	11 35 52.1	8.278
8	13 39 40.93	1.9379	11 44 7.4	8.231
9	13 41 37.27	1.9401	11 52 19.8	8.182
10	13 43 33.74	1.9423	12 0 29.2	8.133
11	13 45 30.34	1.9445	12 8 35.7	8.083
12	13 47 27.08	1.9467	12 16 39.2	8.032
13	13 49 23.95	1.9489	12 24 39.6	7.981
14	13 51 20.95	1.9512	12 32 36.9	7.929
15	13 53 18.09	1.9535	12 40 31.1	7.877
16	13 55 15.37	1.9557	12 48 22.2	7.825
17	13 57 12.78	1.9580	12 56 10.1	7.771
18	13 59 10.33	1.9604	13 3 54.7	7.717
19	14 1 8.03	1.9628	13 11 36.1	7.662
20	14 3 5.87	1.9652	13 19 14.2	7.607
21	14 5 3.85	1.9676	13 26 48.9	7.551
22	14 7 1.98	1.9700	13 34 20.3	7.494
23	14 9 0.25	1.9724	S. 13 41 48.2	7.437

MONDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	14 10 58.67	1.9749	S. 13 49 12.7	7.379
1	14 12 57.24	1.9774	13 56 33.7	7.321
2	14 14 55.96	1.9799	14 3 51.2	7.262
3	14 16 54.83	1.9824	14 11 5.2	7.202
4	14 18 53.85	1.9849	14 18 15.5	7.142
5	14 20 53.02	1.9874	14 25 22.2	7.082
6	14 22 52.34	1.9900	14 32 25.3	7.021
7	14 24 51.82	1.9926	14 39 24.7	6.959
8	14 26 51.45	1.9952	14 46 20.3	6.896
9	14 28 51.24	1.9978	14 53 12.2	6.833
10	14 30 51.19	2.0004	15 0 0.3	6.769
11	14 32 51.29	2.0030	15 6 44.5	6.705
12	14 34 51.55	2.0057	15 13 24.9	6.641
13	14 36 51.97	2.0083	15 20 1.4	6.575
14	14 38 52.55	2.0110	15 26 33.9	6.508
15	14 40 53.29	2.0137	15 33 2.4	6.441
16	14 42 54.19	2.0163	15 39 26.9	6.374
17	14 44 55.25	2.0191	15 45 47.3	6.307
18	14 46 56.48	2.0218	15 52 3.7	6.239
19	14 48 57.87	2.0245	15 58 16.0	6.170
20	14 50 59.42	2.0272	16 4 24.1	6.100
21	14 53 1.14	2.0300	16 10 28.0	6.030
22	14 55 3.02	2.0327	16 16 27.7	5.959
23	14 57 5.06	2.0354	16 22 23.1	5.888
24	14 59 7.27	2.0382	S. 16 28 14.3	5.817

TUESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 59 7.27	2.0382	S. 16 28 14.3	5.817
1	15 1 9.64	2.0409	16 34 1.1	5.744
2	15 3 12.18	2.0437	16 39 43.6	5.671
3	15 5 14.89	2.0466	16 45 21.7	5.597
4	15 7 17.77	2.0493	16 50 55.3	5.523
5	15 9 20.81	2.0521	16 56 24.5	5.449
6	15 11 24.02	2.0549	17 1 49.2	5.374
7	15 13 27.40	2.0577	17 7 9.4	5.298
8	15 15 30.94	2.0604	17 12 25.0	5.222
9	15 17 34.65	2.0632	17 17 36.0	5.145
10	15 19 38.53	2.0660	17 22 42.4	5.067
11	15 21 42.57	2.0688	17 27 44.1	4.989
12	15 23 46.78	2.0716	17 32 41.1	4.911
13	15 25 51.16	2.0744	17 37 33.4	4.832
14	15 27 55.71	2.0772	17 42 20.9	4.752
15	15 30 0.42	2.0799	17 47 3.7	4.672
16	15 32 5.30	2.0827	17 51 41.6	4.592
17	15 34 10.35	2.0856	17 56 14.7	4.511
18	15 36 15.57	2.0883	18 0 42.9	4.429
19	15 38 20.95	2.0911	18 5 6.2	4.346
20	15 40 26.50	2.0938	18 9 24.5	4.263
21	15 42 32.21	2.0966	18 13 37.8	4.180
22	15 44 38.09	2.0993	18 17 46.1	4.097
23	15 46 44.13	2.1021	S. 18 21 49.4	4.013

WEDNESDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 48 50.34	2.1048	S. 18 25 47.7	3.929
1	15 50 56.71	2.1076	18 29 40.9	3.843
2	15 53 3.25	2.1103	18 33 28.9	3.757
3	15 55 9.95	2.1130	18 37 11.7	3.670
4	15 57 16.81	2.1157	18 40 49.3	3.583
5	15 59 23.83	2.1184	18 44 21.7	3.497
6	16 1 31.02	2.1212	18 47 48.9	3.409
7	16 3 38.37	2.1238	18 51 10.8	3.321
8	16 5 45.88	2.1265	18 54 27.4	3.232
9	16 7 53.55	2.1291	18 57 38.6	3.142
10	16 10 1.37	2.1317	19 0 44.5	3.053
11	16 12 9.35	2.1343	19 3 45.0	2.963
12	16 14 17.49	2.1370	19 6 40.1	2.873
13	16 16 25.79	2.1396	19 9 29.7	2.782
14	16 18 34.24	2.1422	19 12 13.9	2.691
15	16 20 42.85	2.1447	19 14 52.6	2.598
16	16 22 51.61	2.1472	19 17 25.7	2.506
17	16 25 0.52	2.1498	19 19 53.3	2.413
18	16 27 9.59	2.1524	19 22 15.3	2.320
19	16 29 18.81	2.1549	19 24 31.7	2.227
20	16 31 28.18	2.1573	19 26 42.5	2.133
21	16 33 37.69	2.1597	19 28 47.6	2.039
22	16 35 47.35	2.1622	19 30 47.1	1.944
23	16 37 57.16	2.1647	19 32 40.9	1.848
24	16 40 7.12	2.1672	S. 19 34 28.9	1.753

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 40 7.12	2.1672	S. 19 34 28.9	1.753
1	16 42 17.22	2.1695	19 36 11.2	1.657
2	16 44 27.46	2.1719	19 37 47.7	1.560
3	16 46 37.85	2.1743	19 39 18.4	1.463
4	16 48 48.38	2.1766	19 40 43.3	1.366
5	16 50 59.05	2.1789	19 42 2.3	1.268
6	16 53 9.85	2.1812	19 43 15.5	1.171
7	16 55 20.79	2.1835	19 44 22.8	1.072
8	16 57 31.87	2.1857	19 45 24.2	0.973
9	16 59 43.08	2.1879	19 46 19.6	0.874
10	17 1 54.42	2.1902	19 47 9.1	0.775
11	17 4 5.90	2.1924	19 47 52.6	0.676
12	17 6 17.51	2.1946	19 48 30.2	0.577
13	17 8 29.25	2.1967	19 49 1.8	0.476
14	17 10 41.11	2.1987	19 49 27.3	0.374
15	17 12 53.10	2.2008	19 49 46.7	0.273
16	17 15 5.21	2.2028	19 50 0.1	0.172
17	17 17 17.44	2.2049	19 50 7.4	− 0.072
18	17 19 29.80	2.2069	19 50 8.7	+ 0.029
19	17 21 42.27	2.2088	19 50 3.9	0.132
20	17 23 54.86	2.2108	19 49 52.9	0.235
21	17 26 7.57	2.2127	19 49 35.7	0.337
22	17 28 20.39	2.2147	19 49 12.4	0.440
23	17 30 33.33	2.2166	S. 19 48 42.9	0.542

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 32 46.38	2.2184	S. 19 48 7.3	0.645
1	17 34 59.54	2.2202	19 47 25.5	0.749
2	17 37 12.81	2.2220	19 46 37.4	0.853
3	17 39 26.18	2.2237	19 45 43.1	0.957
4	17 41 39.66	2.2255	19 44 42.6	1.061
5	17 43 53.24	2.2272	19 43 35.8	1.166
6	17 46 6.92	2.2289	19 42 22.7	1.271
7	17 48 20.71	2.2306	19 41 3.3	1.375
8	17 50 34.59	2.2322	19 39 37.7	1.479
9	17 52 48.57	2.2337	19 38 5.8	1.584
10	17 55 2.64	2.2353	19 36 27.6	1.689
11	17 57 16.81	2.2369	19 34 43.1	1.795
12	17 59 31.07	2.2384	19 32 52.2	1.901
13	18 1 45.42	2.2399	19 30 55.0	2.006
14	18 3 59.86	2.2414	19 28 51.5	2.111
15	18 6 14.39	2.2428	19 26 41.7	2.217
16	18 8 29.00	2.2442	19 24 25.5	2.323
17	18 10 43.69	2.2456	19 22 2.9	2.429
18	18 12 58.47	2.2470	19 19 34.0	2.535
19	18 15 13.33	2.2483	19 16 58.7	2.641
20	18 17 28.26	2.2495	19 14 17.1	2.747
21	18 19 43.27	2.2508	19 11 29.1	2.853
22	18 21 58.36	2.2521	19 8 34.7	2.960
23	18 24 13.52	2.2533	19 5 33.9	3.066
24	18 26 28.76	2.2546	S. 19 2 26.8	3.172

SATURDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 26 28.76	2.2546	S. 19 2 26.8	3.172
1	18 28 44.07	2.2557	18 59 13.3	3.278
2	18 30 59.45	2.2568	18 55 53.4	3.385
3	18 33 14.89	2.2579	18 52 27.1	3.491
4	18 35 30.40	2.2590	18 48 54.5	3.597
5	18 37 45.97	2.2601	18 45 15.5	3.703
6	18 40 1.61	2.2612	18 41 30.1	3.809
7	18 42 17.31	2.2622	18 37 38.4	3.915
8	18 44 33.07	2.2632	18 33 40.3	4.021
9	18 46 48.89	2.2641	18 29 35.8	4.127
10	18 49 4.76	2.2650	18 25 25.0	4.233
11	18 51 20.69	2.2660	18 21 7.8	4.340
12	18 53 36.68	2.2669	18 16 44.2	4.446
13	18 55 52.72	2.2677	18 12 14.3	4.551
14	18 58 8.81	2.2686	18 7 38.1	4.657
15	19 0 24.95	2.2694	18 2 55.5	4.762
16	19 2 41.14	2.2702	17 58 6.6	4.867
17	19 4 57.38	2.2710	17 53 11.4	4.972
18	19 7 13.66	2.2717	17 48 10.0	5.076
19	19 9 29.99	2.2725	17 43 2.3	5.181
20	19 11 46.36	2.2732	17 37 48.3	5.286
21	19 14 2.78	2.2740	17 32 27.9	5.391
22	19 16 19.24	2.2747	17 27 1.3	5.495
23	19 18 35.74	2.2754	S. 17 21 28.5	5.598

SUNDAY, APRIL 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 20 52.29	2.2761	S. 17 15 49.5	5.702

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter	1	17	26.1
● New Moon	8	16	31.3
☽ First Quarter . . .	15	8	31.3
○ Full Moon	23	6	4.7
☾ Last Quarter	31	8	21.3

	d	h
☾ Perigee	9	11.2
☾ Apogee	24	4.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Regulus	W.	94° 8′ 24″	2934	95° 40′ 0″	2922	97° 11′ 51″	2910	98° 43′ 57″	2897
	Spica	W.	40 18 53	2914	41 50 54	2902	43 23 10	2890	44 55 41	2878
	Venus	E.	51 57 51	3322	50 34 5	3309	49 10 4	3296	47 45 48	3283
	α Aquilæ	E.	61 21 43	3463	60 0 37	3469	58 39 38	3475	57 18 46	3483
	Sun	E.	98 13 5	3300	96 48 53	3287	95 24 26	3273	93 59 43	3258
2	Regulus	W.	106 28 39	2829	108 2 29	2815	109 36 38	2800	111 11 6	2785
	Spica	W.	52 42 32	2808	54 16 49	2793	55 51 26	2778	57 26 23	2763
	Venus	E.	40 40 32	3213	39 14 38	3198	37 48 26	3182	36 21 55	3167
	α Aquilæ.	E.	50 37 18	3551	49 17 50	3572	47 58 45	3597	46 40 7	3625
	Sun	E.	86 51 51	3183	85 25 22	3167	83 58 33	3150	82 31 24	3133
3	Spica	W.	65 26 26	2679	67 3 34	2662	68 41 5	2644	70 19 0	2626
	Antares	W.	20 56 5	2905	22 28 17	2859	24 1 28	2818	25 35 33	2780
	Venus	E.	29 4 36	3087	27 36 10	3071	26 7 25	3055	24 38 20	3040
	Sun	E.	75 10 23	3043	73 41 4	3024	72 11 21	3005	70 41 15	2986
4	Spica	W.	78 34 48	2534	80 15 14	2514	81 56 7	2496	83 37 26	2477
	Antares	W.	33 37 11	2627	35 15 29	2601	36 54 22	2576	38 33 50	2551
	Sun	E.	63 4 37	2887	61 32 2	2868	59 59 2	2848	58 25 36	2828
5	Spica	W.	92 10 43	2382	93 54 43	2364	95 39 10	2345	97 24 4	2326
	Antares	W.	46 59 27	2436	48 42 10	2415	50 25 23	2393	52 9 7	2373
	Sun	E.	50 31 56	2728	48 55 54	2710	47 19 27	2691	45 42 35	2672
6	Spica	W.	106 15 11	2239	108 2 41	2221	109 50 37	2205	111 38 57	2188
	Antares	W.	60 55 0	2276	62 41 34	2258	64 28 35	2241	66 16 1	2224
	Sun	E.	37 32 5	2585	35 52 50	2570	34 13 14	2556	32 33 18	2542
10	Sun	W.	18 49 32	2392	20 33 18	2381	22 17 20	2375	24 1 31	2371
	Aldebaran	E.	60 27 39	2003	58 34 9	2008	56 40 47	2013	54 47 33	2019
	Jupiter	E.	74 3 10	2022	72 10 10	2026	70 17 17	2032	68 24 33	2038
	Pollux	E.	102 56 50	2084	101 5 27	2088	99 14 9	2092	97 22 58	2097
11	Sun	W.	32 42 39	2384	34 26 36	2392	36 10 22	2400	37 53 57	2409
	Aldebaran	E.	45 24 15	2062	43 32 17	2073	41 40 36	2084	39 49 12	2096
	Jupiter	E.	59 3 36	2079	57 12 2	2090	55 20 50	2100	53 29 51	2112
	Pollux	E.	88 9 26	2135	86 19 21	2145	84 29 31	2157	82 39 58	2168
12	Sun	W.	46 28 13	2467	48 10 12	2480	49 51 53	2494	51 33 15	2508
	Jupiter	E.	44 19 38	2178	42 30 37	2193	40 41 59	2208	38 53 43	2224
	Pollux	E.	73 36 53	2236	71 49 19	2252	70 2 9	2268	68 15 23	2285
	Regulus	E.	110 8 49	2162	108 19 24	2174	106 30 18	2188	104 41 33	2202
13	Sun	W.	59 54 51	2587	61 34 4	2603	63 12 55	2620	64 51 23	2637
	Jupiter	E.	29 58 34	2312	28 12 52	2331	26 27 38	2351	24 42 53	2373
	Pollux	E.	59 28 1	2379	57 43 56	2400	56 0 21	2421	54 17 17	2443
	Regulus	E.	95 43 11	2277	93 56 38	2293	92 10 29	2309	90 24 43	2325
14	Sun	W.	72 57 57	2723	74 34 6	2741	76 9 51	2759	77 45 13	2775
	α Arietis	W.	32 41 26	2585	34 20 42	2584	35 59 59	2586	37 39 13	2590
	Pollux	E.	45 50 7	2567	44 10 27	2595	42 31 25	2624	40 53 3	2656
	Regulus	E.	81 41 46	2407	79 58 22	2424	78 15 22	2441	76 32 46	2458

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Regulus	W.	100° 16′ 20″	2834	101° 48′ 59″	2871	103° 21′ 55″	2858	104° 55′ 8″	2844
	Spica	W.	46 28 28	2865	48 1 32	2851	49 34 54	2837	51 8 34	2823
	Venus	E.	46 21 17	3270	44 56 30	3256	43 31 27	3242	42 6 8	3228
	α Aquilæ	E.	55 58 3	3493	54 37 31	3504	53 17 11	3517	51 57 6	3533
	Sun	E.	92 34 43	3245	91 9 27	3230	89 43 53	3214	88 18 1	3199
2	Regulus	W.	112 45 54	2769	114 21 2	2753	115 56 31	2738	117 32 21	2721
	Spica	W.	59 1 40	2746	60 37 19	2730	62 13 19	2713	63 49 41	2696
	Venus	E.	34 55 6	3151	33 27 58	3134	32 0 30	3119	30 32 43	3102
	α Aquilæ	E.	45 22 0	3658	44 4 28	3696	42 47 37	3741	41 31 33	3792
	Sun	E.	81 3 55	3116	79 36 5	3098	78 7 53	3080	76 39 19	3062
3	Spica	W.	71 57 20	2608	73 36 4	2590	75 15 13	2571	76 54 48	2553
	Antares	W.	27 10 27	2746	28 46 6	2713	30 22 28	2683	31 59 30	2654
	Venus	E.	23 8 57	3026	21 39 16	3013	20 9 19	3001	18 39 7	2991
	Sun	E.	69 10 45	2966	67 39 50	2947	66 8 31	2927	64 36 47	2907
4	Spica	W.	85 19 12	2457	87 1 25	2439	88 44 4	2420	90 27 10	2401
	Antares	W.	40 13 52	2527	41 54 27	2504	43 35 35	2481	45 17 15	2458
	Sun	E.	56 51 44	2808	55 17 26	2788	53 42 42	2768	52 7 32	2748
5	Spica	W.	99 9 25	2309	100 55 12	2290	102 41 26	2272	104 28 6	2255
	Antares	W.	53 53 20	2353	55 38 3	2333	57 23 14	2314	59 8 53	2295
	Sun	E.	44 5 17	2654	42 27 35	2635	40 49 28	2618	39 10 58	2601
6	Spica	W.	113 27 42	2173	115 16 50	2158	117 6 20	2143	118 56 13	2129
	Antares	W.	68 3 53	2207	69 52 10	2192	71 40 50	2176	73 29 53	2161
	Sun	E.	30 53 3	2530	29 12 31	2518	27 31 43	2508	25 50 41	2500
10	Sun	W.	25 45 48	2370	27 30 6	2371	29 14 22	2374	30 58 34	2379
	Aldebaran	E.	52 54 29	2026	51 1 36	2034	49 8 55	2043	47 16 28	2052
	Jupiter	E.	66 31 58	2045	64 39 34	2053	62 47 22	2060	60 55 22	2070
	Pollux	E.	95 31 55	2103	93 41 1	2110	91 50 17	2118	89 59 45	2126
11	Sun	W.	39 37 19	2419	41 20 27	2430	43 3 19	2441	44 45 55	2454
	Aldebaran	E.	37 58 6	2109	36 7 20	2122	34 16 55	2137	32 26 52	2153
	Jupiter	E.	51 39 10	2124	49 48 47	2137	47 58 44	2150	46 9 1	2163
	Pollux	E.	80 50 42	2180	79 1 45	2193	77 13 7	2206	75 24 49	2221
12	Sun	W.	53 14 17	2523	54 54 58	2539	56 35 17	2554	58 15 15	2570
	Jupiter	E.	37 5 51	2240	35 18 23	2257	33 31 21	2274	31 44 44	2293
	Pollux	E.	66 29 1	2302	64 43 5	2321	62 57 36	2340	61 12 34	2359
	Regulus	E.	102 53 9	2216	101 5 6	2231	99 17 25	2247	97 30 7	2262
13	Sun	W.	66 29 28	2654	68 7 10	2671	69 44 29	2688	71 21 25	2706
	Jupiter	E.	22 58 40	2396	21 15 0	2421	19 31 55	2448	17 49 28	2479
	Pollux	E.	52 34 44	2467	50 52 44	2490	49 11 17	2514	47 30 24	2540
	Regulus	E.	88 39 20	2341	86 54 21	2358	85 9 46	2374	83 25 34	2391
14	Sun	W.	79 20 13	2793	80 54 50	2811	82 29 4	2828	84 2 56	2845
	α Arietis	W.	39 18 21	2595	40 57 22	2603	42 36 13	2611	44 14 53	2620
	Pollux	E.	39 15 24	2689	37 38 29	2724	36 2 21	2762	34 27 3	2802
	Regulus	E.	74 50 34	2475	73 8 45	2492	71 27 20	2508	69 46 18	2525

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
15	Sun	W.	85° 36′ 25″	2862	87° 9′ 32″	2679	88° 42′ 18″	2696	90° 14′ 42″	2913
	α Arietis	W.	45 53 21	2629	47 31 36	2639	49 9 38	2649	50 47 26	2060
	Saturn	W.	28 21 30	2551	30 1 33	2566	31 41 15	2582	33 20 35	2597
	Pollux	E.	32 52 38	2847	31 19 11	2896	29 46 47	2950	28 15 32	3012
	Regulus	E.	68 5 39	2541	66 25 23	2558	64 45 30	2574	63 5 59	2590
16	Sun	W.	97 51 28	2993	99 21 50	3009	100 51 52	3024	105 21 35	3038
	α Arietis	W.	58 52 38	2718	60 28 54	2730	62 4 54	2742	63 40 38	2753
	Saturn	W.	41 32 5	2672	43 9 23	2686	44 46 22	2700	46 23 2	2714
	Aldebaran	W.	25 15 4	2675	26 52 17	2687	28 29 15	2696	30 5 58	2708
	Regulus	E.	54 53 54	2670	53 16 34	2685	51 39 34	2701	50 2 55	2716
	Spica	E.	108 33 15	2641	106 55 15	2654	105 17 34	2668	103 40 11	2680
17	Sun	W.	109 45 43	3109	111 13 41	3123	112 41 23	3136	114 8 49	3148
	α Arietis	W.	71 35 31	2811	73 9 45	2822	74 43 44	2833	76 17 29	2845
	Saturn	W.	54 21 53	2779	55 56 48	2791	57 31 27	2803	59 5 51	2815
	Aldebaran	W.	38 5 53	2764	39 41 8	2775	41 16 8	2786	42 50 54	2798
	Jupiter	W.	23 58 50	2818	25 32 54	2826	27 6 48	2835	28 40 31	2844
	Regulus	E.	42 4 43	2792	40 30 5	2807	38 55 46	2822	37 21 47	2838
	Spica	E.	95 37 47	2747	94 2 10	2759	92 26 49	2771	90 51 43	2783
18	Sun	W.	121 22 17	3209	122 48 16	3219	124 14 2	3230	125 39 36	3240
	α Arietis	W.	84 2 47	2895	85 35 12	2905	87 7 24	2915	88 39 24	2924
	Saturn	W.	66 54 5	2870	68 27 2	2880	69 59 47	2890	71 32 19	2899
	Aldebaran	W.	50 41 15	2848	52 14 40	2858	53 47 53	2867	55 20 54	2876
	Jupiter	W.	36 26 9	2889	37 58 42	2898	39 31 3	2907	41 3 13	2915
	Regulus	E.	29 37 2	2921	28 5 10	2941	26 33 43	2962	25 2 42	2984
	Spica	E.	82 59 57	2837	81 26 17	2847	79 52 50	2857	78 19 36	2866
19	α Arietis	W.	96 16 29	2969	97 47 21	2977	99 18 3	2985	100 48 35	2993
	Saturn	W.	79 12 3	2943	80 43 27	2951	82 14 41	2959	83 45 45	2966
	Aldebaran	W.	63 3 12	2918	64 35 8	2925	66 6 55	2933	67 38 32	2940
	Jupiter	W.	48 41 21	2957	50 12 28	2964	51 43 26	2971	53 14 15	2979
	Pollux	W.	23 7 9	3516	24 27 15	3457	25 48 27	3408	27 10 34	3368
	Spica	E.	70 36 19	2910	69 4 13	2917	67 32 16	2925	66 0 29	2932
20	Saturn	W.	91 18 52	3001	92 49 4	3006	94 19 9	3013	95 49 6	3018
	Aldebaran	W.	75 14 26	2973	76 45 13	2979	78 15 52	2985	79 46 24	2989
	Jupiter	W.	60 46 8	3011	62 16 7	3017	63 45 58	3023	65 15 42	3029
	Pollux	W.	34 10 29	3947	35 35 43	3933	37 1 13	3921	38 26 57	3911
	Spica	E.	58 23 47	2965	56 52 51	2972	55 22 3	2977	53 51 22	2984
	Antares	E.	103 51 2	2997	102 20 46	3004	100 50 38	3009	99 20 37	3014
21	Aldebaran	W.	87 17 27	3014	88 47 22	3019	90 17 11	3023	91 46 55	3028
	Jupiter	W.	72 42 44	3054	74 11 50	3058	75 40 51	3062	77 9 47	3066
	Pollux	W.	45 38 5	3179	47 4 39	3176	48 31 17	3173	49 57 59	3170
	Spica	E.	46 19 38	3008	44 49 35	3013	43 19 38	3017	41 49 47	3021
	Antares	E.	91 52 5	3038	90 22 40	3043	88 53 21	3047	87 24 7	3051
22	Aldebaran	W.	99 14 21	3045	100 43 38	3048	102 12 51	3051	103 42 0	3054
	Jupiter	W.	84 33 13	3085	86 1 41	3088	87 30 5	3091	88 58 26	3094
	Pollux	W.	57 12 6	3162	58 39 0	3162	60 5 55	3161	61 32 51	3160
	Regulus	W.	20 10 57	3196	21 37 11	3179	23 3 45	3167	24 30 34	3156

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
15	SUN	W.	91 46 44	2930	93 18 25	2946	94 49 46	2961	96 20 47	2977
	α Arietis	W.	52 24 59	2672	54 2 17	2683	55 39 20	2695	57 16 7	2707
	SATURN	W.	34 59 34	2612	36 38 13	2627	38 16 31	2643	39 54 28	2658
	Pollux	E.	26 45 34	3082	25 17 2	3162	23 50 8	3257	22 25 6	3369
	Regulus	E.	61 26 50	2606	59 48 3	2622	58 9 38	2638	56 31 35	2654
16	SUN	W.	103 51 0	3053	105 20 7	3068	106 48 56	3082	108 17 28	3096
	α Arietis	W.	65 16 7	2765	66 51 21	2777	68 26 19	2788	70 1 2	2799
	SATURN	W.	47 59 24	2727	49 35 28	2741	51 11 14	2754	52 46 42	2767
	Aldebaran	W.	31 42 27	2719	33 18 41	2731	34 54 40	2742	36 30 24	2753
	Regulus	E.	48 26 36	2731	47 50 37	2747	45 14 59	2762	43 39 41	2777
	Spica	E.	102 3 6	2695	100 26 20	2709	98 49 52	2722	97 13 41	2734
17	SUN	W.	115 36 0	3161	117 2 56	3173	118 29 37	3185	119 56 4	3197
	α Arietis	W.	77 50 59	2855	79 24 15	2866	80 57 18	2875	82 30 9	2885
	SATURN	W.	60 39 59	2827	62 13 52	2838	63 47 31	2849	65 20 55	2860
	Aldebaran	W.	44 25 25	2808	45 59 42	2818	47 33 46	2828	49 7 37	2838
	JUPITER	W.	30 14 2	2653	31 47 21	2862	33 20 29	2871	34 53 25	2880
	Regulus	E.	35 48 9	2854	34 14 51	2870	32 41 53	2887	31 9 17	2903
	Spica	E.	89 16 53	2795	87 42 18	2805	86 7 57	2816	84 33 50	2827
18	SUN	W.	127 4 58	3251	128 30 7	3261	129 55 4	3270	131 19 50	3281
	α Arietis	W.	90 11 12	2934	91 42 48	2943	93 14 13	2952	94 45 26	2960
	SATURN	W.	73 4 39	2909	74 36 47	2918	76 8 43	2927	77 40 28	2935
	Aldebaran	W.	56 53 44	2885	58 26 22	2894	59 58 49	2901	61 31 6	2910
	JUPITER	W.	42 35 12	2924	44 7 0	2933	45 38 37	2941	47 10 4	2949
	Regulus	E.	23 32 9	3009	22 2 7	3036	20 32 39	3068	19 3 50	3105
	Spica	E.	76 46 34	2875	75 13 43	2884	73 41 4	2893	72 8 36	2901
19	α Arietis	W.	102 18 56	3001	103 49 7	3009	105 19 9	3016	106 49 2	3023
	SATURN	W.	85 16 40	2974	86 47 26	2981	88 18 3	2987	89 48 32	2994
	Aldebaran	W.	69 10 0	2947	70 41 19	2954	72 12 29	2961	73 43 31	2966
	JUPITER	W.	54 44 54	2986	56 15 24	2993	57 45 46	2998	59 16 1	3005
	Pollux	W.	28 33 27	3334	29 56 59	3306	31 21 3	3283	32 45 34	3263
	Spica	E.	64 28 51	2939	62 57 22	2946	61 26 2	2953	59 54 50	2960
20	SATURN	W.	97 18 57	3023	98 48 41	3029	100 18 18	3034	101 47 49	3039
	Aldebaran	W.	81 16 50	2995	82 47 9	3001	84 17 21	3005	85 47 27	3010
	JUPITER	W.	66 45 19	3034	68 14 50	3039	69 44 14	3044	71 13 32	3149
	Pollux	W.	39 52 53	3203	41 18 59	3195	42 45 14	3189	44 11 36	3183
	Spica	E.	52 20 49	2989	50 50 22	2993	49 20 1	2998	47 49 46	3004
	Antares	E.	97 50 42	3019	96 20 53	3025	94 51 11	3030	93 21 35	3034
21	Aldebaran	W.	93 16 33	3031	94 46 7	3035	96 15 36	3038	97 45 1	3043
	JUPITER	W.	78 38 38	3070	80 7 24	3074	81 36 5	3078	83 4 41	3082
	Pollux	W.	51 24 44	3168	52 51 31	3166	54 18 21	3164	55 45 13	3163
	Spica	E.	40 20 0	3025	38 50 18	3028	37 20 40	3032	35 51 7	3035
	Antares	E.	85 54 58	3056	84 25 54	3060	82 56 55	3063	81 28 0	3067
22	Aldebaran	W.	105 11 6	3057	106 40 8	3059	108 9 8	3061	109 38 5	3064
	JUPITER	W.	90 26 43	3096	91 54 57	3100	93 23 7	3101	94 51 15	3104
	Pollux	W.	62 59 48	3160	64 26 45	3160	65 53 42	3159	67 20 40	3159
	Regulus	W.	25 57 36	3148	27 24 48	3141	28 52 8	3135	30 19 35	3130

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
22	Spica	E.	34° 21′ 38″	3038	32° 52′ 13″	3042	31° 22′ 52″	3044	29° 53′ 34″	3047
	Antares	E.	79 59 10	3070	78 30 24	3073	77 1 42	3077	75 33 4	3081
23	**Jupiter**	W.	96 19 20	3106	97 47 22	3108	99 15 22	3109	100 43 20	3111
	Pollux	W.	68 47 38	3159	70 14 36	3159	71 41 34	3159	73 8 32	3159
	Regulus	W.	31 47 8	3126	33 14 46	3123	34 42 28	3120	36 10 13	3118
	Antares	E.	68 10 53	3095	66 42 37	3097	65 14 24	3100	63 46 14	3102
24	**Jupiter**	W.	108 2 42	3118	109 30 30	3119	110 58 17	3119	112 26 4	3119
	Pollux	W.	80 23 23	3159	81 50 21	3158	83 17 20	3158	84 44 19	3158
	Regulus	W.	43 29 38	3108	44 57 38	3106	46 25 40	3105	47 53 43	3104
	Antares	E.	56 26 8	3114	54 58 15	3116	53 30 25	3118	52 2 37	3120
25	Pollux	W.	91 59 19	3156	93 26 21	3155	94 53 24	3154	96 20 28	3153
	Regulus	W.	55 14 28	3096	56 42 43	3093	58 11 1	3091	59 39 21	3090
	Antares	E.	44 44 19	3132	43 16 48	3134	41 49 20	3138	40 21 56	3141
	α Aquilæ	E.	96 38 38	3471	95 17 42	3469	93 56 43	3466	92 35 41	3463
26	Regulus	W.	67 1 44	3076	68 30 23	3073	69 59 6	3069	71 27 53	3066
	Antares	E.	33 6 4	3164	31 39 12	3171	30 12 28	3179	28 45 54	3189
	α Aquilæ	E.	85 49 56	3455	84 28 42	3455	83 7 28	3454	81 46 13	3454
	Venus	E.	106 59 19	3512	105 39 8	3508	104 18 53	3506	102 58 35	3502
27	Regulus	W.	78 53 0	3044	80 22 18	3039	81 51 42	3034	83 21 13	3028
	Spica	W.	25 0 19	3024	26 30 2	3019	27 59 51	3014	29 29 46	3009
	α Aquilæ	E.	75 0 2	3458	73 38 51	3460	72 17 42	3462	70 56 35	3464
	Venus	E.	96 15 59	3479	94 55 12	3475	93 34 20	3469	92 13 21	3463
	Sun	E.	139 22 51	3413	138 0 49	3407	136 38 41	3400	135 16 25	3394
28	Regulus	W.	90 50 37	2997	92 20 54	2989	93 51 21	2981	95 21 57	2973
	Spica	W.	37 1 12	2977	38 31 54	2969	40 2 45	2961	41 33 46	2954
	α Aquilæ	E.	64 11 59	3487	62 51 20	3493	61 30 48	3501	60 10 25	3510
	Venus	E.	85 26 42	3429	84 4 58	3421	82 43 5	3413	81 21 3	3405
	Mars	E.	102 46 33	3290	101 22 10	3282	99 57 38	3274	98 32 56	3265
	Sun	E.	128 23 5	3357	126 59 59	3348	125 36 43	3338	124 13 16	3329
29	Spica	W.	49 11 31	2909	50 43 39	2898	52 16 0	2887	53 48 35	2877
	α Aquilæ	E.	53 31 23	3574	52 12 20	3592	50 53 37	3612	49 35 16	3636
	Venus	E.	74 28 21	3356	73 5 15	3345	71 41 56	3335	70 18 24	3323
	Mars	E.	91 26 44	3216	90 0 54	3205	88 34 51	3194	87 8 34	3183
	Sun	E.	117 13 16	3279	115 48 40	3268	114 23 51	3256	112 58 48	3244
30	Spica	W.	61 35 4	2818	63 9 9	2805	64 43 30	2792	66 18 9	2778
	Venus	E.	63 17 19	3261	61 52 22	3247	60 27 9	3234	59 1 40	3220
	Mars	E.	79 53 37	3119	78 25 51	3105	76 57 48	3092	75 29 29	3078
	Sun	E.	105 49 52	3178	104 23 17	3165	102 56 26	3150	101 29 17	3135
31	Spica	W.	74 15 59	2706	75 52 31	2690	77 29 24	2675	79 6 38	2658
	Antares	W.	29 27 32	2831	31 1 19	2805	32 35 40	2779	34 10 35	2755
	Venus	E.	51 49 59	3146	50 22 45	3130	48 55 12	3114	47 27 20	3099
	Mars	E.	68 3 23	3002	66 33 13	2986	65 2 43	2970	63 31 53	2954
	α Pegasi	E.	74 59 42	2877	73 26 54	2864	71 53 49	2852	70 20 28	2840
	Sun	E.	94 8 54	3056	92 39 50	3039	91 10 26	3022	89 40 41	3005

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	Spica E.	28° 24′ 20″	3050	26° 55′ 9″	3052	25° 26′ 1″	3055	23° 56′ 56″	3057
	Antares E.	74 4 31	3083	72 36 1	3087	71 7 35	3089	69 39 12	3092
23	Jupiter W.	102 11 16	3113	103 39 10	3114	105 7 2	3115	106 34 53	3117
	Pollux W.	74 35 30	3159	76 2 28	3159	77 29 26	3159	78 56 24	3158
	Regulus W.	37 38 1	3115	39 5 52	3114	40 33 45	3112	42 1 40	3110
	Antares E.	62 18 7	3105	60 50 3	3107	59 22 2	3109	57 54 4	3111
24	Jupiter W.	113 53 50	3119	115 21 36	3120	116 49 21	3120	118 17 6	3119
	Pollux W.	86 11 18	3158	87 38 17	3157	89 5 17	3157	90 32 18	3157
	Regulus W.	49 21 48	3102	50 49 55	3100	52 18 4	3099	53 46 15	3097
	Antares E.	50 34 52	3123	49 7 10	3124	47 39 30	3127	46 11 53	3129
25	Pollux W.	97 47 33	3152	99 14 39	3152	100 41 46	3151	102 8 54	3149
	Regulus W.	61 7 43	3087	62 36 8	3084	64 4 37	3082	65 33 9	3079
	Antares E.	38 54 36	3144	37 27 20	3148	36 0 9	3152	34 33 3	3158
	α Aquilæ E.	91 14 36	3462	89 53 29	3460	88 32 20	3458	87 11 9	3456
26	Regulus W.	72 56 44	3062	74 25 40	3058	75 54 41	3053	77 23 48	3049
	Antares E.	27 19 32	3201	25 53 24	3215	24 27 33	3233	23 2 3	3256
	α Aquilæ E.	80 24 58	3454	79 3 43	3454	77 42 28	3455	76 21 14	3457
	Venus E.	101 38 13	3498	100 17 47	3494	98 57 16	3489	97 36 40	3485
27	Regulus W.	84 50 51	3022	86 20 36	3017	87 50 28	3010	89 20 28	3003
	Spica W.	30 59 48	3003	32 29 57	2997	34 0 14	2990	35 30 39	2984
	α Aquilæ E.	69 35 31	3468	68 14 31	3471	66 53 35	3476	65 32 44	3481
	Venus E.	90 52 16	3457	89 31 4	3450	88 9 44	3444	86 48 17	3437
	Sun E.	133 54 2	3387	132 31 31	3379	131 8 51	3372	129 46 2	3365
28	Regulus W.	96 52 43	2965	98 23 39	2957	99 54 46	2948	101 26 4	2938
	Spica W.	43 4 57	2945	44 36 19	2937	46 7 51	2928	47 39 35	2918
	α Aquilæ E.	58 50 12	3520	57 30 10	3531	56 10 20	3544	54 50 44	3557
	Venus E.	79 58 52	3396	78 36 31	3386	77 13 59	3377	75 51 16	3366
	Mars E.	97 8 4	3257	95 43 2	3247	93 17 48	3237	92 52 22	3226
	Sun E.	122 49 38	3320	121 25 50	3311	120 1 51	3300	118 37 40	3289
29	Spica W.	55 21 23	2866	56 54 25	2855	58 27 42	2842	60 1 15	2830
	α Aquilæ E.	48 17 21	3663	46 59 55	3693	45 43 0	3727	44 26 41	3766
	Venus E.	68 54 39	3311	67 30 40	3299	66 6 28	3287	64 42 1	3275
	Mars E.	85 42 4	3171	84 15 20	3158	82 48 21	3146	81 21 7	3133
	Sun E.	111 33 31	3232	110 8 0	3219	108 42 13	3206	107 16 11	3192
30	Spica W.	67 53 6	2764	69 28 21	2750	71 3 54	2735	72 39 47	2721
	Venus E.	57 35 55	3206	56 9 53	3191	54 43 33	3176	53 16 55	3161
	Mars E.	74 0 52	3063	72 31 57	3048	71 2 44	3034	69 33 13	3018
	Sun E.	100 1 50	3120	98 34 5	3105	97 6 1	3088	95 37 37	3073
31	Spica W.	80 44 14	2642	82 22 12	2626	84 0 32	2609	85 39 15	2593
	Antares W.	35 46 2	2731	37 22 0	2709	38 58 28	2686	40 35 26	2664
	Venus E.	45 59 9	3083	44 30 39	3067	43 1 49	3051	41 32 39	3035
	Mars E.	62 0 42	2937	60 29 10	2920	58 57 17	2903	57 25 2	2886
	α Pegasi E.	68 46 52	2828	67 13 0	2815	65 38 52	2804	64 4 29	2793
	Sun E.	88 10 34	2987	86 40 5	2969	85 9 14	2951	83 38 0	2933

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sun.	1	0 42 0.16	9.099	N. 4 31 15.3	+57.85	16 2.14	64.51	3 58.68	0.756
Mon.	2	0 45 38.61	9.105	4 54 21.5	57.65	16 1.85	64.53	3 40.62	0.750
Tues.	3	0 49 17.19	9.111	5 17 22.5	57.43	16 1.57	64.55	3 22.70	0.744
Wed.	4	0 52 55.94	9.118	5 40 18.0	+57.19	16 1.29	64.57	3 4.94	0.737
Thur.	5	0 56 34.85	9.126	6 3 7.6	56.95	16 1.01	64.59	2 47.35	0.729
Frid.	6	1 0 13.96	9.134	6 25 51.0	56.68	16 0.73	64.61	2 29.95	0.721
Sat.	7	1 3 53.27	9.143	6 48 27.7	+56.39	16 0.45	64.64	2 12.76	0.712
Sun.	8	1 7 32.80	9.152	7 10 57.5	56.10	16 0.18	64.68	1 55.79	0.703
Mon.	9	1 11 12.57	9.162	7 33 19.9	55.78	15 59.91	64.72	1 39.06	0.693
Tues.	10	1 14 52.60	9.173	7 55 34.7	+55.45	15 59.64	64.76	1 22.58	0.682
Wed.	11	1 18 32.88	9.184	8 17 41.4	55.11	15 59.37	64.80	1 6.33	0.671
Thur.	12	1 22 13.43	9.195	8 39 39.8	54.75	15 59.11	64.85	0 50.39	0.660
Frid.	13	1 25 54.27	9.207	9 1 29.4	+54.38	15 58.85	64.89	0 34.72	0.648
Sat.	14	1 29 35.41	9.220	9 23 10.0	54.00	15 58.59	64.94	0 19.35	0.635
Sun.	15	1 33 16.87	9.234	9 44 41.2	53.60	15 58.33	64.99	0 4.30	0.621
Mon.	16	1 36 58.66	9.248	10 6 2.6	+53.18	15 58.07	65.05	0 10.42	0.607
Tues.	17	1 40 40.80	9.263	10 27 14.0	52.75	15 57.81	65.10	0 24.80	0.592
Wed.	18	1 44 23.31	9.279	10 48 15.1	52.32	15 57.55	65.16	0 38.81	0.577
Thur.	19	1 48 6.20	9.296	11 9 5.6	+51.87	15 57.28	65.22	0 52.43	0.560
Frid.	20	1 51 49.50	9.313	11 29 45.0	51.40	15 57.04	65.28	1 5.65	0.543
Sat.	21	1 55 33.22	9.331	11 50 13.1	50.92	15 56.77	65.34	1 18.46	0.525
Sun.	22	1 59 17.36	9.349	12 10 29.5	+50.43	15 56.53	65.41	1 30.84	0.507
Mon.	23	2 3 1.96	9.368	12 30 34.0	49.92	15 56.26	65.47	1 42.76	0.488
Tues.	24	2 6 47.02	9.388	12 50 26.2	49.40	15 56.02	65.54	1 54.22	0.468
Wed.	25	2 10 32.56	9.409	13 10 5.8	+48.87	15 55.75	65.61	2 5.21	0.447
Thur.	26	2 14 18.60	9.429	13 29 32.5	48.33	15 55.50	65.68	2 15.69	0.427
Frid.	27	2 18 5.15	9.451	13 48 46.1	47.78	15 55.25	65.75	2 25.63	0.405
Sat.	28	2 21 52.22	9.473	14 7 46.1	+47.22	15 55.00	65.82	2 35.08	0.383
Sun.	29	2 25 39.82	9.495	14 26 32.2	46.63	15 54.75	65.89	2 44.05	0.361
Mon.	30	2 29 27.96	9.518	14 45 4.1	46.03	15 54.50	65.97	2 52.43	0.338
Tues.	31	2 33 16.66	9.541	N.15 3 21.5	+45.42	15 54.26	66.05	3 0.26	0.315

Note.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sun.	1	0 41 59.56	9.101	N. 4 31 11.4	+57.86	3 58.72	0.756	0 38 0.84
Mon.	2	0 45 38.05	9.107	4 54 17.9	57.66	3 40.66	0.750	0 41 57.39
Tues.	3	0 49 16.68	9.113	5 17 19.2	57.44	3 22.74	0.744	0 45 53.94
Wed.	4	0 52 55.47	9.120	5 40 15.0	+57.20	8 4.98	0.737	0 49 50.49
Thur.	5	0 56 34.43	9.128	6 3 4.9	56.96	2 47.39	0.729	0 53 47.04
Frid.	6	1 0 13.58	9.136	6 25 48.6	56.69	2 29.99	0.721	0 57 43.59
Sat.	7	1 3 52.94	9.145	6 48 25.6	+56.40	2 12.79	0.712	1 1 40.15
Sun.	8	1 7 32.51	9.154	7 10 55.7	56.11	1 55.81	0.703	1 5 36.70
Mon.	9	1 11 12.32	9.164	7 33 18.4	55.79	1 39.07	0.693	1 9 33.25
Tues.	10	1 14 52.39	9.175	7 55 33.4	+55.46	1 22.59	0.682	1 13 29.80
Wed.	11	1 18 32.71	9.186	8 17 40.4	55.12	1 6.35	0.671	1 17 26.36
Thur.	12	1 22 13.30	9.197	8 39 39.1	54.76	0 50.39	0.660	1 21 22.91
Frid.	13	1 25 54.18	9.209	9 1 29.0	+54.39	0 34.72	0.648	1 25 19.46
Sat.	14	1 29 35.36	9.222	9 23 9.8	54.01	0 19.35	0.635	1 29 16.01
Sun.	15	1 33 16.86	9.236	9 44 41.2	53.61	0 4.30	0.621	1 33 12.56
Mon.	16	1 36 58.69	9.250	10 6 2.8	+53.19	0 10.42	0.607	1 37 9.11
Tues.	17	1 40 40.87	9.265	10 27 14.4	52.76	0 24.80	0.592	1 41 5.67
Wed.	18	1 44 23.41	9.280	10 48 15.7	52.33	0 38.81	0.577	1 45 2.22
Thur.	19	1 48 6.34	9.297	11 9 6.3	+51.88	0 52.44	0.560	1 48 58.78
Frid.	20	1 51 49.67	9.314	11 29 45.9	51.41	1 5.66	0.543	1 52 55.33
Sat.	21	1 55 33.42	9.332	11 50 14.2	50.94	1 18.47	0.525	1 56 51.89
Sun.	22	1 59 17.59	9.350	12 10 30.8	+50.44	1 30.85	0.507	2 0 48.44
Mon.	23	2 3 2.22	9.369	12 30 35.5	49.93	1 42.77	0.488	2 4 44.99
Tues.	24	2 6 47.31	9.389	12 50 27.8	49.41	1 54.23	0.468	2 8 41.54
Wed.	25	2 10 32.88	9.410	13 10 7.5	+48.89	2 5.22	0.447	2 12 38.10
Thur.	26	2 14 18.95	9.431	13 29 34.3	48.34	2 15.70	0.427	2 16 34.65
Frid.	27	2 18 5.53	9.452	13 48 48.0	47.78	2 25.68	0.405	2 20 31.21
Sat.	28	2 21 52.63	9 474	14 7 48.1	+47.22	2 35.14	0.383	2 24 27.76
Sun.	29	2 25 40.25	9.496	14 26 34.3	46.63	2 44.07	0.361	2 28 24.32
Mon.	30	2 29 28.42	9.519	14 45 6.3	46.03	2 52.45	0.338	2 32 20.87
Tues.	31	2 33 17.14	9.542	N. 15 3 23.8	+45.42	8 0.28	0.315	2 36 17.43

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,
$+ 9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	91	11 25 31.5	25 7.4	147.89	+ 0.82	9.9999403	+ 53.2	23 18 9.48
2	92	12 24 39.9	24 15.7	147.81	0.83	0.0000679	53.1	23 14 13.57
3	93	13 23 46.5	23 22.2	147.74	0.83	0.0001951	52.9	23 10 17.66
4	94	14 22 51.2	22 26.9	147.66	+ 0.79	0.0003218	+ 52.7	23 6 21.75
5	95	15 21 54.1	21 29.7	147.58	0.71	0.0004480	52.3	23 2 25 86
6	96	16 20 55.0	20 30.5	147.49	0.62	0.0005733	52.0	22 58 29.95
7	97	17 19 53.9	19 29.3	147.41	+ 0.49	0.0006977	+ 51.6	22 54 34.04
8	98	18 18 50.8	18 26.1	147.32	0.37	0.0008214	51.3	22 50 38.14
9	99	19 17 45.7	17 20.9	147.24	0.24	0.0009441	50.9	22 46 42.24
10	100	20 16 38.5	16 13.6	147.15	+ 0.11	0.0010659	+ 50.6	22 42 46.33
11	101	21 15 29.1	15 4.1	147.06	− 0.02	0.0011868	50.2	22 38 50.42
12	102	22 14 17.4	13 52.3	146.97	0.13	0.0013070	49.9	22 34 54.52
13	103	23 13 3.5	12 38.3	146.88	− 0.24	0.0014264	+ 49.6	22 30 58.62
14	104	24 11 47.4	11 22.1	146.78	0.30	0.0015451	49.3	22 27 2.71
15	105	25 10 29.0	10 3.6	146.69	0.34	0.0016633	49.1	22 23 6.80
16	106	26 9 8.3	8 42.8	146.59	− 0.35	0.0017809	+ 48.9	22 19 10.89
17	107	27 7 45.4	7 19.8	146.50	0.32	0.0018981	48.8	22 15 14 99
18	108	28 6 20.4	5 54.7	146.41	0.28	0.0020152	48.7	22 11 19.08
19	109	29 4 53.3	4 27.5	146.32	− 0.20	0.0021318	+ 48.6	22 7 23.17
20	110	30 3 24.1	2 58.2	146 24	− 0.11	0.0022484	48.6	22 3 27.26
21	111	31 1 53.0	1 27.0	146.16	+ 0.01	0.0023648	48.5	21 59 31.35
22	112	31 60 19.9	59 53.8	146.08	+ 0.14	0.0024811	+ 48.4	21 55 35.44
23	113	32 58 45.0	58 18.8	146.00	0.28	0.0025971	48.3	21 51 39.53
24	114	33 57 8.3	56 42.0	145.93	0.41	0.0027129	48.2	21 47 43.62
25	115	34 55 29.8	55 3.4	145.86	+ 0.52	0.0028284	+ 48.0	21 43 47.72
26	116	35 53 49.6	53 23.1	145.79	0.62	0.0029434	47.8	21 39 51.81
27	117	36 52 7.8	51 41.2	145.73	0.71	0.0030579	47.6	21 35 55.90
28	118	37 50 24.5	49 57.8	145.67	+ 0.77	0.0031717	+ 47.3	21 31 59 99
29	119	38 48 39.7	48 12.9	145.61	0.79	0.0032848	46.9	21 28 4.09
30	120	39 46 53.5	46 26.5	145.54	0.78	0.0033969	46.4	21 24 8.18
31	121	40 45 5.8	44 38.7	145.48	+ 0.72	0.0035077	+ 45.9	21 20 12.27

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^{\mathrm{d}}.0$.

Diff. for 1 Hour, $-9^{\mathrm{s}}.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 39.6	15 47.0	57 21.5	+ 2.22	57 48.7	+ 2.30	19 23.9	2.20	23.3
2	15 54.6	16 2.3	58 16.6	2.33	58 44.8	2.33	20 16.9	2.21	24.3
3	16 9.8	16 17.2	59 12.6	2.28	59 39.5	2.17	21 10.1	2.23	25.3
4	16 24.0	16 30.0	60 4.7	+ 2.01	60 27.6	+ 1.77	22 3.9	2.26	26.3
5	16 35.6	16 40.0	60 47.4	1.49	61 3.5	1.16	22 58.8	2.31	27.3
6	16 43.2	16 45.1	61 15.2	+ 0.78	61 22.2	+ 0.37	23 55.0	2.38	28.3
7	16 45.7	16 44.8	61 24.2	− 0.05	61 21.0	− 0.47	☌		29.3
8	16 42.6	16 39.1	61 12.9	0.87	61 0.0	1.25	0 52.8	2.44	0.9
9	16 34.4	16 28.7	60 42.9	1.53	60 22.0	1.86	1 51.9	2.48	1.9
10	16 22.2	16 15.1	59 58.2	− 2.08	59 32.1	− 2.24	2 51.3	2.47	2.9
11	16 7.6	15 59.9	59 4.5	2.34	58 36.0	2.38	3 50.0	2.41	3.9
12	15 52.1	15 44.6	58 7.3	2.37	57 38.9	2.33	4 46.6	2.30	4.9
13	15 36.8	15 29.6	57 11.3	− 2.24	56 45.0	− 2.12	5 40.3	2.17	5.9
14	15 22 9	15 16.7	56 20.3	1.99	55 57.3	1.83	6 30.8	2.03	6.9
15	15 11.0	15 5.8	55 36.4	1.66	55 17.4	1.49	7 18.3	1.92	7.9
16	15 1.2	14 57.2	55 0.6	− 1.31	54 40.0	− 1.13	8 3.3	1.83	8.9
17	14 53.8	14 51.0	54 33.5	0.96	54 23.0	0.76	8 46.5	1.77	9.9
18	14 48.7	14 46.9	54 14.5	0.62	54 7.9	0.47	9 28.7	1.75	10.9
19	14 45.6	14 44.7	54 3.1	− 0.33	53 59.9	− 0.19	10 10.6	1.75	11.9
20	14 44.3	14 44.3	53 58.4	− 0.06	53 58.4	+ 0.06	10 52.9	1.78	12.9
21	14 44.7	14 45.4	53 59.8	+ 0.17	54 2.5	0.27	11 36.1	1.83	13 9
22	14 46.5	14 47.9	54 6.5	+ 0.38	54 11.8	+ 0.49	12 20.7	1.89	14.9
23	14 49.7	14 51.8	54 18.2	0.58	54 25.9	0.69	13 7.0	1.97	15.9
24	14 54.2	14 56.9	54 34.8	0.79	54 44.9	0.90	13 55.0	2.04	16.9
25	15 0.0	15 3.5	54 56.3	+ 1.01	55 9.0	+ 1.12	14 44.6	2.09	17.9
26	15 7.3	15 11.5	55 23.1	1.23	55 38.4	1.33	15 35.2	2.12	18.9
27	15 16.1	15 21.0	55 55.2	1.46	56 13.4	1.57	16 26.4	2.14	19.9
28	15 26.3	15 32.0	56 32.9	+ 1.68	56 53.7	+ 1.78	17 17.7	2.14	20.9
29	15 38.0	15 44.2	57 15.6	1.87	57 38.5	1.94	18 8.9	2.13	21.9
30	15 50.7	15 57.2	58 2.2	1.99	58 26.2	2.01	19 0.1	2.14	22.9
31	16 3.8	16 10.2	58 50.4	+ 2.00	59 14.1	+ 1.94	19 51.7	2.17	23.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 1.					**TUESDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 20 52.29	2.2761	S.17 15 49.5	5.702	0	21 10 40.59	2.2981	S.10 50 1.3	10.165
1	19 23 8.87	2.2767	17 10 4.2	5.806	1	21 12 58.49	2.2987	10 39 49.1	10.242
2	19 25 25.49	2.2772	17 4 12.8	5.909	2	21 15 16.43	2.2992	10 29 32.3	10.318
3	19 27 42.14	2.2778	16 58 15.2	6.012	3	21 17 34.40	2.2997	10 19 10.9	10.393
4	19 29 58.83	2.2785	16 52 11.4	6.114	4	21 19 52.40	2.3003	10 8 45.1	10.468
5	19 32 15.56	2.2791	16 46 1.5	6.217	5	21 22 10.44	2.3010	9 58 14.8	10.542
6	19 34 32.32	2.2797	16 39 45.4	6.319	6	21 24 28.52	2.3016	9 47 40.1	10.614
7	19 36 49.12	2.2802	16 33 23.2	6.421	7	21 26 46.63	2.3022	9 37 1.1	10.686
8	19 39 5.94	2.2806	16 26 54.9	6.522	8	21 29 4.78	2.3028	9 26 17.8	10.757
9	19 41 22.79	2.2811	16 20 20.6	6.622	9	21 31 22.97	2.3035	9 15 30.3	10.827
10	19 43 39.67	2.2817	16 13 40.2	6.723	10	21 33 41.20	2.3041	9 4 38.6	10.895
11	19 45 56.59	2.2823	16 6 53.8	6.824	11	21 35 59.47	2.3047	8 53 42.9	10.962
12	19 48 13.54	2.2828	16 0 1.3	6.924	12	21 38 17.77	2.3053	8 42 43.2	11.029
13	19 50 30.52	2.2832	15 53 2.9	7.023	13	21 40 36.11	2.3061	8 31 39.5	11.095
14	19 52 47.52	2.2836	15 45 58.5	7.122	14	21 42 54.50	2.3070	8 20 31.8	11.160
15	19 55 4.55	2.2841	15 38 48.2	7.221	15	21 45 12.95	2.3078	8 9 20.3	11.223
16	19 57 21.61	2.2845	15 31 32.0	7.319	16	21 47 31.44	2.3086	7 58 5.0	11.286
17	19 59 38.69	2.2849	15 24 9.9	7.417	17	21 49 49.98	2.3093	7 46 46.0	11.347
18	20 1 55.80	2.2853	15 16 41.9	7.515	18	21 52 8.56	2.3101	7 35 23.4	11.407
19	20 4 12.93	2.2857	15 9 8.1	7.612	19	21 54 27.19	2.3110	7 23 57.2	11.467
20	20 6 30.09	2.2862	15 1 28.5	7.708	20	21 56 45.88	2.3119	7 12 27.4	11.525
21	20 8 47.28	2.2867	14 53 43.1	7.804	21	21 59 4.62	2.3128	7 0 54.2	11.582
22	20 11 4.49	2.2871	14 45 52.0	7.899	22	22 1 23.41	2.3137	6 49 17.6	11.637
23	20 13 21.73	2.2875	S.14 37 55.2	7.995	23	22 3 42.26	2.3147	S. 6 37 37.7	11.692
	MONDAY 2.					**WEDNESDAY 4.**			
0	20 15 38.99	2.2878	S.14 29 52.6	8.090	0	22 6 1.17	2.3157	S. 6 25 54.6	11.745
1	20 17 56.27	2.2882	14 21 44.4	8.183	1	22 8 20.14	2.3167	6 14 8.3	11.797
2	20 20 13.58	2.2887	14 13 30.6	8.277	2	22 10 39.17	2.3176	6 2 18.9	11.849
3	20 22 30.91	2.2891	14 5 11.2	8.370	3	22 12 58.25	2.3186	5 50 26.4	11.899
4	20 24 48.27	2.2895	13 56 46.2	8.462	4	22 15 17.40	2.3197	5 38 31.0	11.947
5	20 27 5.65	2.2898	13 48 15.8	8.553	5	22 17 36 61	2.3208	5 26 32.7	11.995
6	20 29 23.05	2.2902	13 39 39.9	8.644	6	22 19 55.89	2.3219	5 14 31.6	12.042
7	20 31 40.48	2.2906	13 30 58.5	8.735	7	22 22 15.24	2.3231	5 2 27.7	12.087
8	20 33 57.93	2.2910	13 22 11.7	8.824	8	22 24 34.66	2.3242	4 50 21.2	12.129
9	20 36 15.40	2.2914	13 13 19.6	8.913	9	22 26 54.14	2.3254	4 38 12.2	12.171
10	20 38 32.90	2.2918	13 4 22.1	9.003	10	22 29 13.70	2.3266	4 26 0.7	12.212
11	20 40 50.42	2.2922	12 55 19.3	9.090	11	22 31 33.33	2.3278	4 13 46.7	12.252
12	20 43 7.97	2.2927	12 46 11.3	9.177	12	22 33 53.04	2.3291	4 1 30.4	12.291
13	20 45 25.54	2.2931	12 36 58.1	9.264	13	22 36 12.82	2.3304	3 49 11.8	12.327
14	20 47 43.14	2.2935	12 27 39.7	9.350	14	22 38 32.68	2.3318	3 36 51.1	12.362
15	20 50 0.76	2.2939	12 18 16.1	9.435	15	22 40 52.63	2.3332	3 24 28.3	12.397
16	20 52 18.41	2.2943	12 8 47.5	9.519	16	22 43 12.66	2.3345	3 12 3.4	12.431
17	20 54 36.08	2.2947	11 59 13.9	9.603	17	22 45 32.77	2.3359	2 59 36.6	12.462
18	20 56 53.78	2.2952	11 49 35.2	9.686	18	22 47 52.97	2.3374	2 47 8.0	12.492
19	20 59 11.51	2.2957	11 39 51.6	9.767	19	22 50 13.26	2.3388	2 34 37.6	12.521
20	21 1 29.27	2.2962	11 30 3.2	9.847	20	22 52 33.63	2.3402	2 22 5.5	12.547
21	21 3 47.06	2.2967	11 20 9.9	9.928	21	22 54 54.09	2.3417	2 9 31.9	12.572
22	21 6 4.88	2.2972	11 10 11.8	10.008	22	22 57 14.64	2.3433	1 56 56.8	12.597
23	21 8 22.72	2.2976	11 0 8.9	10.087	23	22 59 35.29	2.3450	1 44 20.2	12.621
24	21 10 40.59	2.2981	S.10 50 1.3	10.165	24	23 1 56.04	2.3467	S. 1 31 42.3	12.642

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 1 56.04	2.3467	S. 1 31 42.3	12.642
1	23 4 16.89	2.3483	1 19 3.2	12.662
2	23 6 37.83	2.3499	1 6 22.9	12.681
3	23 8 58.87	2.3515	0 53 41.5	12.697
4	23 11 20.01	2.3532	0 40 59.2	12.712
5	23 13 41.26	2.3550	0 28 16.0	12.726
6	23 16 2.61	2.3568	0 15 32.1	12.737
7	23 18 24.07	2.3586	S. 0 2 47.5	12.748
8	23 20 45.64	2.3604	N. 0 9 57.7	12.758
9	23 23 7.32	2.3622	0 22 43.5	12.767
10	23 25 29.11	2.3641	0 35 29.7	12.773
11	23 27 51.01	2.3660	0 48 16.2	12.777
12	23 30 13.03	2.3680	1 1 2.9	12.779
13	23 32 35.17	2.3699	1 13 49.7	12.781
14	23 34 57.42	2.3718	1 26 36.6	12.781
15	23 37 19.79	2.3738	1 39 23.4	12.778
16	23 39 42.28	2.3759	1 52 10.0	12.775
17	23 42 4.90	2.3780	2 4 56.4	12.770
18	23 44 27.64	2.3800	2 17 42.4	12.763
19	23 46 50.50	2.3821	2 30 28.0	12.755
20	23 49 13.49	2.3842	2 43 13.0	12.744
21	23 51 36.61	2.3864	2 55 57.3	12.732
22	23 53 59.86	2.3886	3 8 40.9	12.719
23	23 56 23.24	2.3907	N. 3 21 23.6	12.704

FRIDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 58 46.75	2.3929	N. 3 34 5.4	12.687
1	0 1 10.39	2.3952	3 46 46.1	12.669
2	0 3 34.17	2.3974	3 59 25.7	12.649
3	0 5 58.08	2.3997	4 12 4.0	12.627
4	0 8 22.13	2.4020	4 24 40.9	12.603
5	0 10 46.32	2.4042	4 37 16.4	12.578
6	0 13 10.64	2.4065	4 49 50.3	12.552
7	0 15 35.10	2.4088	5 2 22.6	12.523
8	0 17 59.70	2.4112	5 14 53.1	12.492
9	0 20 24.45	2.4136	5 27 21.7	12.461
10	0 22 49.34	2.4160	5 39 48.4	12.427
11	0 25 14.37	2.4183	5 52 13.0	12.392
12	0 27 39.54	2.4207	6 4 35.5	12.356
13	0 30 4.86	2.4232	6 16 55.7	12.317
14	0 32 30.32	2.4256	6 29 13.5	12.276
15	0 34 55.93	2.4280	6 41 28.8	12.234
16	0 37 21.68	2.4304	6 53 41.6	12.191
17	0 39 47.58	2.4328	7 5 51.7	12.145
18	0 42 13.62	2.4352	7 17 59.0	12.097
19	0 44 39.81	2.4377	7 30 3.4	12.049
20	0 47 6.15	2.4402	7 42 4.9	11.999
21	0 49 32.63	2.4426	7 54 3.3	11.947
22	0 51 59.26	2.4451	8 5 58.5	11.892
23	0 54 26.04	2.4476	8 17 50.4	11.837
24	0 56 52.97	2.4500	N. 8 29 39.0	11.781

SATURDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 56 52.97	2.4500	N. 8 29 39.0	11.781
1	0 59 20.04	2.4524	8 41 24.1	11.722
2	1 1 47.26	2.4549	8 53 5.6	11.662
3	1 4 14.63	2.4573	9 4 43.5	11.600
4	1 6 42.14	2.4597	9 16 17.6	11.536
5	1 9 9.80	2.4622	9 27 47.8	11.471
6	1 11 37.61	2.4647	9 39 14.1	11.404
7	1 14 5.56	2.4670	9 50 36.3	11.336
8	1 16 33.65	2.4694	10 1 54.4	11.266
9	1 19 1.89	2.4718	10 13 8.2	11.194
10	1 21 30.27	2.4742	10 24 17.7	11.121
11	1 23 58.79	2.4766	10 35 22.7	11.046
12	1 26 27.46	2.4790	10 46 23.2	10.970
13	1 28 56.27	2.4813	10 57 19.1	10.892
14	1 31 25.21	2.4835	11 8 10.3	10.812
15	1 33 54.29	2.4858	11 18 56.6	10.731
16	1 36 23.51	2.4881	11 29 38.0	10.649
17	1 38 52.86	2.4904	11 40 14.5	10.567
18	1 41 22.35	2.4926	11 50 46.0	10.482
19	1 43 51.97	2.4948	12 1 12.4	10.395
20	1 46 21.72	2.4970	12 11 33.4	10.305
21	1 48 51.61	2.4992	12 21 49.0	10.215
22	1 51 21.62	2.5013	12 31 59.2	10.125
23	1 53 51.76	2.5033	N. 12 42 4.0	10.033

SUNDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 56 22.02	2.5054	N. 12 52 3.2	9.939
1	1 58 52.41	2.5074	13 1 56.7	9.844
2	2 1 22.91	2.5093	13 11 44.5	9.747
3	2 3 53.53	2.5112	13 21 26.4	9.649
4	2 6 24.26	2.5132	13 31 2.4	9.550
5	2 8 55.11	2.5151	13 40 32.4	9.450
6	2 11 26.07	2.5169	13 49 56.4	9.348
7	2 13 57.14	2.5187	13 59 14.2	9.245
8	2 16 28.31	2.5203	14 8 25.8	9.142
9	2 18 59.58	2.5220	14 17 31.2	9.037
10	2 21 30.95	2.5237	14 26 30.2	8.930
11	2 24 2.42	2.5253	14 35 22.8	8.822
12	2 26 33.99	2.5269	14 44 8.9	8.713
13	2 29 5.65	2.5283	14 52 48.4	8.603
14	2 31 37.39	2.5298	15 1 21.3	8.492
15	2 34 9.22	2.5312	15 9 47.5	8.381
16	2 36 41.13	2.5325	15 18 7.0	8.267
17	2 39 13.12	2.5338	15 26 19.6	8.152
18	2 41 45.19	2.5351	15 34 25.3	8.037
19	2 44 17.33	2.5362	15 42 24.1	7.922
20	2 46 49.53	2.5372	15 50 15.9	7.804
21	2 49 21.80	2.5383	15 58 0.6	7.686
22	2 51 54.13	2.5393	16 5 38.2	7.567
23	2 54 26.51	2.5402	16 13 8.7	7.448
24	2 56 58.95	2.5411	N. 16 20 32.0	7.327

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 9.					**WEDNESDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 56 58.95	2.5411	N.16 20 32.0	7.327	0	4 58 30.02	2.4917	N.19 43 19.5	1.047
1	2 59 31.44	2.5418	16 27 48.0	7.206	1	5 0 59.43	2.4887	19 44 18.4	0.917
2	3 2 3.97	2.5425	16 34 56.7	7.083	2	5 3 28.66	2.4856	19 45 9.5	0.787
3	3 4 36.54	2.5432	16 41 58.0	6.960	3	5 5 57.70	2.4824	19 45 52.9	0.658
4	3 7 9.15	2.5437	16 48 51.9	6.837	4	5 8 26.55	2.4792	19 46 28.5	0.529
5	3 9 41.79	2.5442	16 55 38.4	6.712	5	5 10 55.21	2.4760	19 46 56.4	0.400
6	3 12 14.45	2.5446	17 2 17.4	6.587	6	5 13 23.67	2.4727	19 47 16.5	0.272
7	3 14 47.14	2.5450	17 8 48.8	6.461	7	5 15 51.93	2.4693	19 47 29.0	0.144
8	3 17 19.85	2.5453	17 15 12.7	6.335	8	5 18 19.98	2.4658	19 47 33.8	+ 0.017
9	3 19 52.58	2.5456	17 21 29.0	6.207	9	5 20 47.83	2.4624	19 47 31.0	− 0.110
10	3 22 25.32	2.5457	17 27 37.6	6.079	10	5 23 15.47	2.4588	19 47 20.6	0.236
11	3 24 58.06	2.5457	17 33 38.5	5.950	11	5 25 42.88	2.4550	19 47 2.7	0.362
12	3 27 30.80	2.5457	17 39 31.6	5.821	12	5 28 10.07	2.4513	19 46 37.2	0.488
13	3 30 3.54	2.5457	17 45 17.0	5.692	13	5 30 37.04	2.4476	19 46 4.2	0.611
14	3 32 36.28	2.5455	17 50 54.6	5.562	14	5 33 3.78	2.4437	19 45 23.8	0.734
15	3 35 9.00	2.5452	17 56 24.5	5.432	15	5 35 30.29	2.4398	19 44 36.1	0.857
16	3 37 41.70	2.5448	18 1 46.5	5.302	16	5 37 56.56	2.4358	19 43 41.0	0.979
17	3 40 14.38	2.5445	18 7 0.7	5.171	17	5 40 22.59	2.4319	19 42 38.6	1.102
18	3 42 47.04	2.5441	18 12 7.0	5.039	18	5 42 48.39	2.4279	19 41 28.8	1.223
19	3 45 19.67	2.5435	18 17 5.4	4.907	19	5 45 13.94	2.4238	19 40 11.8	1.343
20	3 47 52.26	2.5428	18 21 55.9	4.775	20	5 47 39.24	2.4196	19 38 47.6	1.463
21	3 50 24.80	2.5420	18 26 38.4	4.642	21	5 50 4.29	2.4153	19 37 16.3	1.581
22	3 52 57.30	2.5412	18 31 12.9	4.509	22	5 52 29.08	2.4111	19 35 37.9	1.699
23	3 55 29.75	2.5403	N.18 35 39.5	4.377	23	5 54 53.62	2.4068	N.19 33 52.4	1.817
	TUESDAY 10.					**THURSDAY 12.**			
0	3 58 2.14	2.5393	N.18 39 58.1	4.243	0	5 57 17.90	2.4024	N.19 31 59.8	1.934
1	4 0 34.47	2.5383	18 44 8.7	4.110	1	5 59 41.91	2.3980	19 30 0.3	2.050
2	4 3 6.74	2.5372	18 48 11.3	3.976	2	6 2 5.66	2.3936	19 27 53.8	2.166
3	4 5 38.94	2.5360	18 52 5.8	3.842	3	6 4 29.14	2.3891	19 25 40.4	2.280
4	4 8 11.06	2.5347	18 55 52.3	3.708	4	6 6 52.35	2.3846	19 23 20.2	2.393
5	4 10 43.10	2.5332	18 59 30.8	3.575	5	6 9 15.29	2.3800	19 20 53.2	2.506
6	4 13 15.05	2.5317	19 3 1.3	3.441	6	6 11 37.95	2.3753	19 18 19.5	2.618
7	4 15 46.91	2.5302	19 6 23.7	3.307	7	6 14 0.33	2.3707	19 15 39.1	2.729
8	4 18 18.68	2.5287	19 9 38.1	3.172	8	6 16 22.43	2.3661	19 12 52.0	2.839
9	4 20 50.35	2.5270	19 12 44.4	3.038	9	6 18 44.26	2.3614	19 9 58.4	2.948
10	4 23 21.92	2.5252	19 15 42.7	2.905	10	6 21 5.80	2.3567	19 6 58.2	3.057
11	4 25 53.37	2.5233	19 18 33.0	2.771	11	6 23 27.06	2.3519	19 3 51.5	3.166
12	4 28 24.71	2.5213	19 21 15.2	2.637	12	6 25 48.03	2.3471	19 0 38.3	3.273
13	4 30 55.93	2.5192	19 23 49.4	2.503	13	6 28 8.71	2.3422	18 57 18.7	3.379
14	4 33 27.02	2.5171	19 26 15.6	2.370	14	6 30 29.10	2.3374	18 53 52.8	3.483
15	4 35 57.98	2.5149	19 28 33.8	2.237	15	6 32 49.20	2.3326	18 50 20.7	3.587
16	4 38 28.81	2.5127	19 30 44.0	2.103	16	6 35 9.01	2.3277	18 46 42.3	3.691
17	4 40 59.50	2.5103	19 32 46.2	1.971	17	6 37 28.52	2.3227	18 42 57.7	3.794
18	4 43 30.04	2.5078	19 34 40.5	1.838	18	6 39 47.74	2.3178	18 39 7.0	3.896
19	4 46 0.44	2.5053	19 36 26.8	1.706	19	6 42 6.66	2.3128	18 35 10.2	3.997
20	4 48 30.68	2.5027	19 38 5.2	1.573	20	6 44 25.28	2.3078	18 31 7.4	4.096
21	4 51 0.76	2.5000	19 39 35.6	1.441	21	6 46 43.60	2.3029	18 26 58.7	4.195
22	4 53 30.68	2.4972	19 40 58.1	1.309	22	6 49 1.63	2.2979	18 22 44.0	4.294
23	4 56 0.43	2.4945	19 42 12.7	1.178	23	6 51 19.35	2.2928	18 18 23.4	4.391
24	4 58 30.02	2.4917	N.19 43 19.5	1.047	24	6 53 36.77	2.2878	N.18 13 57.1	4.487

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 53 36.77	2.2878	N.18 13 57.1	4.487
1	6 55 53.89	2.2828	18 9 25.0	4.582
2	6 58 10.71	2.2777	18 4 47.2	4.677
3	7 0 27.22	2.2727	18 0 3.8	4.770
4	7 2 43.43	2.2677	17 55 14.8	4.863
5	7 4 59.34	2.2627	17 50 20.2	4.955
6	7 7 14.95	2.2576	17 45 20.2	5.045
7	7 9 30.25	2.2525	17 40 14.8	5.135
8	7 11 45.25	2.2474	17 35 4.0	5.225
9	7 13 59.94	2.2423	17 29 47.8	5.313
10	7 16 14.33	2.2372	17 24 26.4	5.400
11	7 18 28.41	2.2322	17 18 59.8	5.486
12	7 20 42.19	2.2272	17 13 28.1	5.571
13	7 22 55.67	2.2221	17 7 51.3	5.655
14	7 25 8.84	2.2170	17 2 9.5	5.738
15	7 27 21.71	2.2120	16 56 22.7	5.821
16	7 29 34.28	2.2070	16 50 30.9	5.903
17	7 31 46.55	2.2020	16 44 34.3	5.983
18	7 33 58.52	2.1970	16 38 32.9	6.063
19	7 36 10.19	2.1920	16 32 26.7	6.142
20	7 38 21.56	2.1870	16 26 15.8	6.220
21	7 40 32.63	2.1821	16 20 0.3	6.297
22	7 42 43.41	2.1772	16 13 40.2	6.372
23	7 44 53.89	2.1722	N.16 7 15.6	6.448

SATURDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 47 4.08	2.1673	N.16 0 46.4	6.523
1	7 49 13.97	2.1624	15 54 12.8	6.596
2	7 51 23.57	2.1576	15 47 34.9	6.668
3	7 53 32.88	2.1527	15 40 52.6	6.741
4	7 55 41.89	2.1479	15 34 6.0	6.812
5	7 57 50.62	2.1431	15 27 15.2	6.881
6	7 59 59.06	2.1383	15 20 20.3	6.949
7	8 2 7.21	2.1335	15 13 21.3	7.018
8	8 4 15.08	2.1287	15 6 18.2	7.086
9	8 6 22.66	2.1240	14 59 11.0	7.152
10	8 8 29.96	2.1193	14 51 59.9	7.217
11	8 10 36.98	2.1147	14 44 45.0	7.281
12	8 12 43.73	2.1102	14 37 26.2	7.345
13	8 14 50.20	2.1055	14 30 3.6	7.407
14	8 16 56.39	2.1009	14 22 37.3	7.469
15	8 19 2.31	2.0964	14 15 7.3	7.531
16	8 21 7.96	2.0919	14 7 33.6	7.592
17	8 23 13.34	2.0874	13 59 56.2	7.652
18	8 25 18.45	2.0830	13 52 15.3	7.710
19	8 27 23.30	2.0786	13 44 31.0	7.768
20	8 29 27.88	2.0742	13 36 43.2	7.825
21	8 31 32.20	2.0699	13 28 52.0	7.881
22	8 33 36.26	2.0656	13 20 57.5	7.936
23	8 35 40.07	2.0613	13 12 59.7	7.991
24	8 37 43.62	2.0570	N.13 4 58.6	8.045

SUNDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 37 43.62	2.0570	N.13 4 58.6	8.045
1	8 39 46.91	2.0528	12 56 54.3	8.097
2	8 41 49.96	2.0487	12 48 46.9	8.149
3	8 43 52.76	2.0447	12 40 36.4	8.201
4	8 45 55.32	2.0406	12 32 22.8	8.252
5	8 47 57.63	2.0365	12 24 6.2	8.301
6	8 49 59.70	2.0325	12 15 46.7	8.349
7	8 52 1.53	2.0286	12 7 24.3	8.398
8	8 54 3.13	2.0247	11 58 59.0	8.446
9	8 56 4.49	2.0208	11 50 30.8	8.492
10	8 58 5.62	2.0169	11 41 59.9	8.537
11	9 0 6.52	2.0131	11 33 26.3	8.582
12	9 2 7.19	2.0093	11 24 50.0	8.627
13	9 4 7.64	2.0056	11 16 11.0	8.671
14	9 6 7.87	2.0020	11 7 29.5	8.714
15	9 8 7.87	1.9983	10 58 45.4	8.756
16	9 10 7.66	1.9948	10 49 58.8	8.797
17	9 12 7.24	1.9913	10 41 9.8	8.837
18	9 14 6.61	1.9878	10 32 18.3	8.877
19	9 16 5.77	1.9843	10 23 24.5	8.917
20	9 18 4.73	1.9809	10 14 28.3	8.956
21	9 20 3.48	1.9775	10 5 29.8	8.993
22	9 22 2.03	1.9742	9 56 29.1	9.030
23	9 24 0.38	1.9709	N. 9 47 26.2	9.066

MONDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 25 58.54	1.9677	N. 9 38 21.2	9.102
1	9 27 56.51	1.9646	9 29 14.0	9.137
2	9 29 54.29	1.9614	9 20 4.8	9.170
3	9 31 51.87	1.9582	9 10 53.6	9.203
4	9 33 49.27	1.9552	9 1 40.4	9.236
5	9 35 46.50	1.9523	8 52 25.3	9.268
6	9 37 43.55	1.9493	8 43 8.2	9.300
7	9 39 40.42	1.9464	8 33 49.3	9.330
8	9 41 37.12	1.9436	8 24 28.6	9.360
9	9 43 33.65	1.9408	8 15 6.1	9.389
10	9 45 30.01	1.9380	8 5 41.9	9.418
11	9 47 26.21	1.9353	7 56 16.0	9.446
12	9 49 22.25	1.9327	7 46 48.4	9.473
13	9 51 18.13	1.9301	7 37 19.2	9.500
14	9 53 13.86	1.9275	7 27 48.4	9.526
15	9 55 9.43	1.9249	7 18 16.1	9.551
16	9 57 4.85	1.9224	7 8 42.3	9.575
17	9 59 0.12	1.9200	6 59 7.1	9.599
18	10 0 55.25	1.9177	6 49 30.4	9.622
19	10 2 50.24	1.9153	6 39 52.4	9.645
20	10 4 45.09	1.9130	6 30 13.0	9.667
21	10 6 39.80	1.9108	6 20 32.3	9.688
22	10 8 34.38	1.9086	6 10 50.4	9.709
23	10 10 28.83	1.9065	6 1 7.2	9.730
24	10 12 23.16	1.9044	N. 5 51 22.8	9.749

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 17.					**THURSDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 12 23.16	1.9044	N. 5 51 22.8	9.749	0	11 42 17.93	1.8599	S. 2 7 19.5	9.968
1	10 14 17.36	1.9023	5 41 37.3	9.767	1	11 44 9.53	1.8602	2 17 17.3	9.957
2	10 16 11.44	1.9003	5 31 50.7	9.786	2	11 46 1.15	1.8604	2 27 14.4	9.947
3	10 18 5.40	1.8984	5 22 3.0	9.804	3	11 47 52.78	1.8607	2 37 10.9	9.936
4	10 19 59.25	1.8966	5 12 14.2	9.821	4	11 49 44.43	1.8610	2 47 6.7	9.923
5	10 21 52.99	1.8947	5 2 24.5	9.837	5	11 51 36.10	1.8613	2 57 1.7	9.911
6	10 23 46.61	1.8928	4 52 33.8	9.853	6	11 53 27.79	1.8617	3 6 56.0	9.898
7	10 25 40.13	1.8911	4 42 42.2	9.868	7	11 55 19.51	1.8622	3 16 49.5	9.885
8	10 27 33.55	1.8894	4 32 49.7	9.883	8	11 57 11.26	1.8627	3 26 42.2	9.871
9	10 29 26.86	1.8877	4 22 56.3	9.897	9	11 59 3.03	1.8632	3 36 34.0	9.856
10	10 31 20.07	1.8861	4 13 2.1	9.909	10	12 0 54.84	1.8638	3 46 24.9	9.840
11	10 33 13.19	1.8846	4 3 7.2	9.921	11	12 2 46.69	1.8644	3 56 14.8	9.824
12	10 35 6.22	1.8831	3 53 11.6	9.932	12	12 4 38.57	1.8650	4 6 3.8	9.808
13	10 36 59.16	1.8816	3 43 15.3	9.944	13	12 6 30.49	1.8658	4 15 51.8	9.791
14	10 38 52.01	1.8802	3 33 18.3	9.956	14	12 8 22.46	1.8666	4 25 38.7	9.773
15	10 40 44.78	1.8788	3 23 20.6	9.967	15	12 10 14.48	1.8673	4 35 24.6	9.756
16	10 42 37.47	1.8776	3 13 22.3	9.976	16	12 12 6.54	1.8681	4 45 9.4	9.737
17	10 44 30.09	1.8763	3 3 23.5	9.984	17	12 13 58.65	1.8689	4 54 53.0	9.717
18	10 46 22.63	1.8751	2 53 24.2	9.992	18	12 15 50.81	1.8698	5 4 35.4	9.697
19	10 48 15.10	1.8739	2 43 24.4	10.000	19	12 17 43.03	1.8708	5 14 16.6	9.676
20	10 50 7.50	1.8727	2 33 24.2	10.008	20	12 19 35.31	1.8717	5 23 56.5	9.655
21	10 51 59.83	1.8716	2 23 23.5	10.015	21	12 21 27.64	1.8727	5 33 35.2	9.633
22	10 53 52.09	1.8706	2 13 22.4	10.021	22	12 23 20.04	1.8738	5 43 12.5	9.610
23	10 55 44.30	1.8697	N. 2 3 21.0	10.025	23	12 25 12.50	1.8748	S. 5 52 48.4	9.587
	WEDNESDAY 18.					**FRIDAY 20.**			
0	10 57 36.45	1.8687	N. 1 53 19.4	10.029	0	12 27 5.02	1.8759	S. 6 2 23.0	9.564
1	10 59 28.55	1.8678	1 43 17.5	10.034	1	12 28 57.61	1.8772	6 11 56.1	9.539
2	11 1 20.59	1.8669	1 33 15.3	10.038	2	12 30 50.28	1.8784	6 21 27.7	9.515
3	11 3 12.58	1.8662	1 23 12.9	10.041	3	12 32 43.02	1.8797	6 30 57.9	9.490
4	11 5 4.53	1.8654	1 13 10.4	10.043	4	12 34 35.84	1.8809	6 40 26.5	9.463
5	11 6 56.43	1.8647	1 3 7.8	10.045	5	12 36 28.73	1.8822	6 49 53.5	9.436
6	11 8 48.29	1.8640	0 53 5.0	10.047	6	12 38 21.70	1.8835	6 59 18.8	9.408
7	11 10 40.11	1.8634	0 43 2.2	10.047	7	12 40 14.75	1.8849	7 8 42.5	9.381
8	11 12 31.90	1.8629	0 32 59.4	10.047	8	12 42 7.89	1.8864	7 18 4.5	9.352
9	11 14 23.66	1.8624	0 22 56.6	10.046	9	12 44 1.12	1.8878	7 27 24.8	9.323
10	11 16 15.39	1.8619	0 12 53.9	10.045	10	12 45 54.43	1.8892	7 36 43.3	9.293
11	11 18 7.09	1.8614	N. 0 2 51.2	10.044	11	12 47 47.83	1.8908	7 46 0.0	9.263
12	11 19 58.76	1.8610	S. 0 7 11.4	10.042	12	12 49 41.33	1.8924	7 55 14.9	9.232
13	11 21 50.41	1.8607	0 17 13.8	10.038	13	12 51 34.92	1.8940	8 4 27.9	9.201
14	11 23 42.04	1.8604	0 27 16.0	10.034	14	12 53 28.61	1.8956	8 13 39.0	9.168
15	11 25 33.66	1.8602	0 37 17.9	10.030	15	12 55 22.39	1.8972	8 22 48.1	9.135
16	11 27 25.26	1.8599	0 47 19.6	10.026	16	12 57 16.27	1.8989	8 31 55.2	9.102
17	11 29 16.85	1.8598	0 57 21.0	10.021	17	12 59 10.26	1.9007	8 41 0.3	9.068
18	11 31 8.44	1.8597	1 7 22.1	10.015	18	13 1 4.35	1.9024	8 50 3.4	9.034
19	11 33 0.02	1.8597	1 17 22.8	10.008	19	13 2 58.55	1.9042	8 59 4.4	8.998
20	11 34 51.60	1.8596	1 27 23.1	10.001	20	13 4 52.85	1.9059	9 8 3.2	8.962
21	11 36 43.17	1.8596	1 37 22.9	9.993	21	13 6 47.26	1.9078	9 16 59.8	8.925
22	11 38 34.75	1.8597	1 47 22.2	9.985	22	13 8 41.79	1.9097	9 25 54.2	8.887
23	11 40 26.34	1.8598	1 57 21.1	9.977	23	13 10 36.43	1.9116	9 34 46.3	8.850
24	11 42 17.93	1.8599	S. 2 7 19.5	9.968	24	13 12 31.18	1.9135	S. 9 43 36.2	8.812

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 21.					MONDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 12 31.18	1.9135	S. 9 43 36.2	8.812	0	14 47 2.55	2.0315	S. 15 50 16.5	6.222
1	13 14 26.05	1.9155	9 52 23.8	8.773	1	14 49 4.52	2.0342	15 56 27.8	6.153
2	13 16 21.04	1.9175	10 1 9.0	8.733	2	14 51 6.66	2.0370	16 2 34.9	6.084
3	13 18 16.15	1.9195	10 9 51.7	8.692	3	14 53 8.96	2.0397	16 8 37.9	6.015
4	13 20 11.38	1.9215	10 18 32.0	8.652	4	14 55 11.43	2.0425	16 14 36.7	5.944
5	13 22 6.73	1.9236	10 27 9.9	8.611	5	14 57 14.06	2.0452	16 20 31.1	5.871
6	13 24 2.21	1.9257	10 35 45.3	8.568	6	14 59 16.86	2.0480	16 26 21.2	5.799
7	13 25 57.82	1.9279	10 44 18.1	8.525	7	15 1 19.82	2.0508	16 32 7.0	5.726
8	13 27 53.56	1.9300	10 52 48.3	8.481	8	15 3 22.95	2.0536	16 37 48.4	5.652
9	13 29 49.42	1.9322	11 1 15.8	8.437	9	15 5 26.25	2.0563	16 43 25.3	5.578
10	13 31 45.42	1.9344	11 9 40.7	8.392	10	15 7 29.71	2.0591	16 48 57.8	5.504
11	13 33 41.55	1.9366	11 18 2.9	8.347	11	15 9 33.34	2.0618	16 54 25.8	5.429
12	13 35 37.81	1.9388	11 26 22.4	8.302	12	15 11 37.13	2.0646	16 59 49.3	5.353
13	13 37 34.21	1.9411	11 34 39.1	8.255	13	15 13 41.08	2.0673	17 5 8.2	5.277
14	13 39 30.75	1.9434	11 42 53.0	8.207	14	15 15 45.21	2.0700	17 10 22.5	5.200
15	13 41 27.42	1.9457	11 51 4.0	8.159	15	15 17 49.49	2.0727	17 15 32.2	5.122
16	13 43 24.23	1.9481	11 59 12.1	8.111	16	15 19 53.94	2.0755	17 20 37.2	5.044
17	13 45 21.19	1.9505	12 7 17.3	8.062	17	15 21 58.55	2.0782	17 25 37.5	4.967
18	13 47 18.29	1.9528	12 15 19.5	8.012	18	15 24 3.32	2.0809	17 30 33.2	4.888
19	13 49 15.53	1.9552	12 23 18.7	7.961	19	15 26 8.25	2.0836	17 35 24.1	4.808
20	13 51 12.92	1.9577	12 31 14.8	7.910	20	15 28 13.35	2.0863	17 40 10.1	4.727
21	13 53 10.46	1.9602	12 39 7.9	7.859	21	15 30 18.61	2.0890	17 44 51.3	4.646
22	13 55 8.14	1.9626	12 46 57.9	7.807	22	15 32 24.03	2.0916	17 49 27.7	4.565
23	13 57 5.97	1.9651	S. 12 54 44.7	7.753	23	15 34 29.60	2.0942	S. 17 53 59.1	4.483
	SUNDAY 22.					TUESDAY 24.			
0	13 59 3.95	1.9676	S. 13 2 28.3	7.699	0	15 36 35.33	2.0968	S. 17 58 25.6	4.401
1	14 1 2.08	1.9701	13 10 8.6	7.645	1	15 38 41.22	2.0995	18 2 47.2	4.318
2	14 3 0.36	1.9727	13 17 45.7	7.591	2	15 40 47.27	2.1022	18 7 3.8	4.234
3	14 4 58.80	1.9752	13 25 19.5	7.535	3	15 42 53.48	2.1048	18 11 15.3	4.150
4	14 6 57.39	1.9777	13 32 49.9	7.479	4	15 44 59.84	2.1073	18 15 21.8	4.066
5	14 8 56.13	1.9803	13 40 16.9	7.423	5	15 47 6.35	2.1098	18 19 23.2	3.981
6	14 10 55.03	1.9829	13 47 40.6	7.366	6	15 49 13.02	2.1124	18 23 19.5	3.895
7	14 12 54.08	1.9855	13 55 0.8	7.307	7	15 51 19.84	2.1149	18 27 10.6	3.809
8	14 14 53.29	1.9882	14 2 17.4	7.247	8	15 53 26.81	2.1174	18 30 56.6	3.723
9	14 16 52.66	1.9908	14 9 30.5	7.188	9	15 55 33.93	2.1199	18 34 37.4	3.637
10	14 18 52.19	1.9935	14 16 40.0	7.128	10	15 57 41.20	2.1224	18 38 13.0	3.549
11	14 20 51.88	1.9961	14 23 45.9	7.068	11	15 59 48.62	2.1249	18 41 43.3	3.461
12	14 22 51.72	1.9988	14 30 48.2	7.007	12	16 1 56.19	2.1273	18 45 8.3	3.372
13	14 24 51.73	2.0015	14 37 46.8	6.945	13	16 4 3.90	2.1298	18 48 28.0	3.283
14	14 26 51.90	2.0042	14 44 41.6	6.883	14	16 6 11.76	2.1322	18 51 42.3	3.194
15	14 28 52.23	2.0068	14 51 32.7	6.820	15	16 8 19.76	2.1345	18 54 51.3	3.105
16	14 30 52.72	2.0095	14 58 20.0	6.756	16	16 10 27.90	2.1368	18 57 54.9	3.014
17	14 32 53.37	2.0122	15 5 3.4	6.691	17	16 12 36.18	2.1392	19 0 53.0	2.923
18	14 34 54.19	2.0150	15 11 42.9	6.626	18	16 14 44.60	2.1415	19 3 45.7	2.832
19	14 36 55.17	2.0177	15 18 18.5	6.560	19	16 16 53.16	2.1438	19 6 32.9	2.741
20	14 38 56.32	2.0205	15 24 50.1	6.494	20	16 19 1.86	2.1461	19 9 14.6	2.649
21	14 40 57.63	2.0232	15 31 17.8	6.428	21	16 21 10.69	2.1483	19 11 50.8	2.557
22	14 42 59.10	2.0259	15 37 41.5	6.361	22	16 23 19.65	2.1504	19 14 21.4	2.464
23	14 45 0.74	2.0287	15 44 1.1	6.292	23	16 25 28.74	2.1526	19 16 46.5	2.371
24	14 47 2.55	2.0315	S. 15 50 16.5	6.222	24	16 27 37.97	2.1548	S. 19 19 6.0	2.277

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 25.					**FRIDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 27 37.97	2.1548	S. 19 19 6.0	2.277	0	18 12 58.61	2.2220	S. 19 15 7.8	2.515
1	16 29 47.32	2.1569	19 21 19.8	2.183	1	18 15 11.95	2.2227	19 12 33.8	2.617
2	16 31 56.80	2.1591	19 23 28.0	2.089	2	18 17 25.33	2.2233	19 9 53.7	2.720
3	16 34 6.41	2.1612	19 25 30.5	1.995	3	18 19 38.74	2.2238	19 7 7.4	2.822
4	16 36 16.14	2.1632	19 27 27.4	1.900	4	18 21 52.19	2.2244	19 4 15.0	2.925
5	16 38 25.99	2.1652	19 29 18.5	1.804	5	18 24 5.67	2.2248	19 1 16.4	3.027
6	16 40 35.97	2.1673	19 31 3.9	1.708	6	18 26 19.17	2.2252	18 58 11.7	3.129
7	16 42 46.07	2.1692	19 32 43.5	1.612	7	18 28 32.70	2.2257	18 55 0.9	3.232
8	16 44 56.28	2.1711	19 34 17.4	1.517	8	18 30 46.26	2.2262	18 51 43.9	3.334
9	16 47 6.60	2.1730	19 35 45.5	1.420	9	18 32 59.84	2.2265	18 48 20.8	3.436
10	16 49 17.04	2.1749	19 37 7.8	1.323	10	18 35 13.44	2.2268	18 44 51.6	3.537
11	16 51 27.59	2.1768	19 38 24.2	1.225	11	18 37 27.06	2.2272	18 41 16.3	3.639
12	16 53 38.25	2.1786	19 39 34.8	1.127	12	18 39 40.71	2.2276	18 37 34.9	3.741
13	16 55 49.02	2.1803	19 40 39.5	1.029	13	18 41 54.37	2.2278	18 33 47.4	3.842
14	16 57 59.89	2.1821	19 41 38.3	0.932	14	18 44 8.05	2.2281	18 29 53.8	3.944
15	17 0 10.87	2.1838	19 42 31.3	0.833	15	18 46 21.74	2.2282	18 25 54.1	4.045
16	17 2 21.95	2.1855	19 43 18.3	0.734	16	18 48 35.44	2.2284	18 21 48.4	4.146
17	17 4 33.13	2.1872	19 43 59.4	0.635	17	18 50 49.14	2.2287	18 17 36.6	4.247
18	17 6 44.41	2.1888	19 44 34.5	0.535	18	18 53 2.88	2.2288	18 13 18.8	4.347
19	17 8 55.78	2.1903	19 45 3.6	0.436	19	18 55 16.61	2.2289	18 8 55.0	4.447
20	17 11 7.25	2.1919	19 45 26.8	0.337	20	18 57 30.35	2.2291	18 4 25.1	4.548
21	17 13 18.81	2.1934	19 45 44.0	0.237	21	18 59 44.10	2.2292	17 59 49.2	4.648
22	17 15 30.46	2.1949	19 45 55.2	0.137	22	19 1 57.85	2.2292	17 55 7.3	4.747
23	17 17 42.20	2.1964	S. 19 46 0.4	− 0.036	23	19 4 11.61	2.2293	S. 17 50 19.5	4.847
	THURSDAY 26.					**SATURDAY 28.**			
0	17 19 54.03	2.1978	S. 19 45 59.5	+ 0.065	0	19 6 25.37	2.2293	S. 17 45 25.7	4.947
1	17 22 5.94	2.1992	19 45 52.6	0.166	1	19 8 39.13	2.2293	17 40 25.9	5.046
2	17 24 17.93	2.2006	19 45 39.6	0.267	2	19 10 52.89	2.2294	17 35 20.2	5.144
3	17 26 30.01	2.2019	19 45 20.6	0.368	3	19 13 6.66	2.2294	17 30 8.6	5.243
4	17 28 42.16	2.2032	19 44 55.5	0.469	4	19 15 20.42	2.2293	17 24 51.1	5.341
5	17 30 54.39	2.2044	19 44 24.3	0.570	5	19 17 34.18	2.2293	17 19 27.7	5.438
6	17 33 6.69	2.2056	19 43 47.1	0.671	6	19 19 47.94	2.2292	17 13 58.5	5.536
7	17 35 19.06	2.2068	19 43 3.8	0.773	7	19 22 1.69	2.2292	17 8 23.4	5.633
8	17 37 31.50	2.2080	19 42 14.3	0.876	8	19 24 15.44	2.2291	17 2 42.5	5.730
9	17 39 44.02	2.2092	19 41 18.7	0.978	9	19 26 29.18	2.2289	16 56 55.8	5.827
10	17 41 56.60	2.2102	19 40 17.0	1.079	10	19 28 42.91	2.2288	16 51 3.3	5.923
11	17 44 9.24	2.2112	19 39 9.2	1.182	11	19 30 56.64	2.2287	16 45 5.0	6.019
12	17 46 21.95	2.2123	19 37 55.2	1.284	12	19 33 10.36	2.2286	16 39 1.0	6.115
13	17 48 34.72	2.2133	19 36 35.1	1.387	13	19 35 24.07	2.2284	16 32 51.2	6.210
14	17 50 47.55	2.2142	19 35 8.8	1.489	14	19 37 37.77	2.2283	16 26 35.8	6.304
15	17 53 0.43	2.2152	19 33 36.4	1.592	15	19 39 51.47	2.2282	16 20 14.7	6.398
16	17 55 13.37	2.2161	19 31 57.8	1.694	16	19 42 5.16	2.2280	16 13 48.0	6.493
17	17 57 26.36	2.2169	19 30 13.1	1.796	17	19 44 18.83	2.2278	16 7 15.6	6.587
18	17 59 39.40	2.2178	19 28 22.3	1.899	18	19 46 32.49	2.2276	16 0 37.6	6.680
19	18 1 52.49	2.2186	19 26 25.3	2.002	19	19 48 46.14	2.2274	15 53 54.0	6.772
20	18 4 5.63	2.2193	19 24 22.1	2.104	20	19 50 59.78	2.2272	15 47 4.9	6.865
21	18 6 18.81	2.2201	19 22 12.8	2.207	21	19 53 13.41	2.2271	15 40 10.2	6.957
22	18 8 32.04	2.2208	19 19 57.3	2.310	22	19 55 27.03	2.2268	15 33 10.0	7.048
23	18 10 45.31	2.2214	19 17 35.6	2.412	23	19 57 40.63	2.2266	15 26 4.4	7.139
24	18 12 58.61	2.2220	S. 19 15 7.8	2.515	24	19 59 54.22	2.2264	S. 15 18 53.3	7.230

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	D'ff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	19 59 54.22	2.2264	S. 15 18 53.3	7.230
1	20 2 7.80	2.2262	15 11 36.8	7.320
2	20 4 21.37	2.2260	15 4 14.9	7.410
3	20 6 34.92	2.2258	14 56 47.6	7.499
4	20 8 48.46	2.2257	14 49 15.0	7.587
5	20 11 2.00	2.2256	14 41 37.1	7.675
6	20 13 15.53	2.2254	14 33 54.0	7.762
7	20 15 29.05	2.2252	14 26 5.6	7.850
8	20 17 42.55	2.2249	14 18 12.0	7.937
9	20 19 56.04	2.2247	14 10 13.2	8.023
10	20 22 9.52	2.2246	14 2 9.2	8.108
11	20 24 22.99	2.2244	13 54 0.2	8.193
12	20 26 36.45	2.2243	13 45 46.1	8.278
13	20 28 49.90	2.2242	13 37 26.9	8.362
14	20 31 3.35	2.2241	13 29 2.7	8.444
15	20 33 16.79	2.2239	13 20 33.6	8.526
16	20 35 30.22	2.2238	13 11 59.6	8.608
17	20 37 43.64	2.2237	13 3 20.6	8.691
18	20 39 57.06	2.2236	12 54 36.7	8.772
19	20 42 10.47	2.2235	12 45 48.0	8.851
20	20 44 23.88	2.2235	12 36 54.6	8.930
21	20 46 37.29	2.2235	12 27 56.4	9.009
22	20 48 50.70	2.2234	12 18 53.5	9.087
23	20 51 4.10	2.2233	S. 12 9 45.9	9.165

MONDAY 30.

Hour.	Right Ascension.	D'ff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	20 53 17.50	2.2233	S. 12 0 33.7	9.242
1	20 55 30.90	2.2234	11 51 16.9	9.318
2	20 57 44.31	2.2235	11 41 55.5	9.394
3	20 59 57.72	2.2236	11 32 29.6	9.468
4	21 2 11.14	2.2237	11 22 59.3	9.542
5	21 4 24.56	2.2237	11 13 24.6	9.616
6	21 6 37.98	2.2238	11 3 45.4	9.689
7	21 8 51.41	2.2240	10 54 1.9	9.760
8	21 11 4.86	2.2242	10 44 14.2	9.831
9	21 13 18.32	2.2244	10 34 22.2	9.902
10	21 15 31.79	2.2246	10 24 26.0	9.971
11	21 17 45.27	2.2248	10 14 25.7	10.040
12	21 19 58.77	2.2251	10 4 21.2	10.108
13	21 22 12.29	2.2254	9 54 12.7	10.175
14	21 24 25.82	2.2257	9 44 0.2	10.242
15	21 26 39.37	2.2261	9 33 43.7	10.307
16	21 28 52.95	2.2265	9 23 23.3	10.372
17	21 31 6.55	2.2268	9 12 59.1	10.436
18	21 33 20.17	2.2272	9 2 31.0	10.500
19	21 35 33.82	2.2277	8 51 59.1	10.562
20	21 37 47.50	2.2282	8 41 23.6	10.623
21	21 40 1.21	2.2287	8 30 44.4	10.683
22	21 42 14.95	2.2293	8 20 1.6	10.743
23	21 44 28.73	2.2299	8 9 15.2	10.802
24	21 46 42.54	2.2305	S. 7 58 25.3	10.861

TUESDAY, MAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	21 46 42.54	2.2305	S. 7 58 25.3	10.861

PHASES OF THE MOON.

	d	h	m
● New Moon	7	1	36.2
☽ First Quarter . . .	13	20	49.5
○ Full Moon	21	23	27.3
☾ Last Quarter. . . .	29	19	3.3

	d	h
☾ Perigee.	6	21.9
☾ Apogee.	20	6.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica	W.	87° 18′ 20″	2575	88° 57′ 49″	2558	90° 37′ 42″	2540	92° 17′ 59″	2522
	Antares	W.	42 12 54	2643	43 50 51	2621	45 29 17	2601	47 8 11	2580
	Venus	E.	40 3 10	3019	38 33 21	3004	37 3 13	2989	35 32 46	2973
	Mars	E.	55 52 25	2869	54 19 26	2852	52 46 5	2834	51 12 21	2817
	α Pegasi	E.	62 29 52	2782	60 55 0	2771	59 19 54	2761	57 44 35	2752
	Sun	E.	82 6 23	2914	80 34 22	2895	79 1 57	2876	77 29 8	2858
2	Spica	W.	100 45 38	2433	102 28 26	2414	104 11 40	2396	105 55 20	2378
	Antares	W.	55 29 49	2478	57 11 33	2458	58 53 45	2438	60 36 25	2419
	Mars	E.	43 18 5	2731	41 42 6	2714	40 5 45	2098	38 29 2	2682
	α Pegasi	E.	49 45 18	2719	48 9 4	2717	46 32 47	2717	44 56 30	2719
	Sun	E.	69 38 51	2760	68 3 31	2741	66 27 46	2722	64 51 35	2702
3	Antares	W.	69 16 38	2324	71 2 2	2306	72 47 53	2288	74 34 10	2270
	α Aquilæ	W.	28 47 52	4913	29 45 56	4614	30 48 9	4354	31 54 12	4130
	Mars	E.	30 20 30	2615	28 41 56	2606	27 3 9	2598	25 24 11	2593
	Sun	E.	56 44 7	2606	55 5 20	2587	53 26 8	2569	51 46 30	2551
4	Antares	W.	83 31 59	2188	85 20 45	2172	87 9 54	2157	88 59 26	2143
	α Aquilæ	W.	38 11 21	3360	39 34 23	3254	40 59 28	3160	42 26 25	3074
	Sun	E.	43 22 11	2465	41 40 8	2449	39 57 43	2434	38 14 57	2420
5	Antares	W.	98 12 12	2081	100 3 41	2070	101 55 26	2060	103 47 26	2051
	α Aquilæ	W.	50 4 21	2758	51 39 44	2711	53 16 10	2668	54 53 33	2629
	Sun	E.	29 36 11	2357	27 51 34	2346	26 6 42	2337	24 21 36	2328
9	Sun	W.	27 17 9	2378	29 1 15	2391	30 45 3	2404	32 28 32	2417
	Pollux	E.	65 16 43	2182	63 27 48	2198	61 39 18	2215	59 51 13	2233
	Regulus	E.	101 38 39	2091	99 47 26	2103	97 56 32	2116	96 5 58	2130
10	Sun	W.	41 0 47	2496	42 42 6	2512	44 23 2	2530	46 3 33	2548
	Pollux	E.	50 58 7	2341	49 13 8	2366	47 28 45	2393	45 45 1	2421
	Regulus	E.	86 58 37	2206	85 10 19	2222	83 22 25	2240	81 34 57	2257
11	Sun	W.	54 19 48	2642	55 57 46	2662	57 35 17	2681	59 12 22	2701
	Pollux	E.	37 17 6	2591	35 37 59	2633	33 59 49	2679	32 22 41	2729
	Regulus	E.	72 44 6	2348	70 59 16	2366	69 14 53	2386	67 30 58	2405
12	Sun	W.	67 11 9	2801	68 45 36	2820	70 19 38	2840	71 53 14	2859
	Aldebaran	W.	21 11 23	2520	22 52 9	2532	24 32 38	2545	26 12 49	2559
	Regulus	E.	58 58 12	2502	57 17 1	2521	55 36 17	2540	53 56 0	2561
	Spica	E.	112 38 11	2474	110 56 21	2492	109 14 57	2510	107 33 58	2529
13	Sun	W.	79 35 1	2955	81 6 10	2973	82 36 56	2992	84 7 19	3010
	Aldebaran	W.	34 28 32	2637	36 6 37	2652	37 44 21	2669	39 21 43	2684
	Jupiter	W.	17 7 5	2764	18 42 20	2767	20 17 31	2773	21 52 34	2781
	Regulus	E.	45 41 22	2659	44 3 47	2678	42 26 38	2698	40 49 55	2718
	Spica	E.	99 15 22	2618	97 36 52	2635	95 58 45	2652	94 21 1	2669
14	Sun	W.	91 33 45	3096	93 2 0	3111	94 29 56	3128	95 57 32	3143
	Aldebaran	W.	47 23 24	2759	48 58 45	2774	50 33 47	2788	52 8 31	2802
	Jupiter	W.	29 44 41	2837	31 18 21	2849	32 51 45	2861	34 24 54	2873
	Regulus	E.	32 53 1	2821	31 19 0	2842	29 45 27	2865	28 12 23	2888

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Spica	W.	93° 58′ 41″	2505	95° 39′ 47″	2487	97° 21′ 19″	2469	99° 3′ 16″	2451
	Antares	W.	48 47 34	2559	50 27 25	2538	52 7 45	2518	53 48 33	2498
	VENUS	E.	34 2 0	2959	32 30 56	2945	30 59 34	2931	29 27 55	2920
	MARS	E.	49 38 15	2799	48 3 46	2782	46 28 55	2765	44 53 41	2748
	α Pegasi	E.	56 9 4	2743	54 33 21	2735	52 57 28	2729	51 21 27	2723
	SUN	E.	75 55 55	2838	74 22 17	2819	72 48 14	2799	71 13 45	2780
2	Spica	W.	107 39 26	2360	109 23 58	2342	111 8 56	2324	112 54 20	2306
	Antares	W.	62 19 33	2400	64 3 8	2380	65 47 11	2362	67 31 41	2343
	MARS	E.	36 51 58	2667	35 14 34	2652	33 36 50	2639	31 58 48	2627
	α Pegasi	E.	43 20 15	2723	41 44 6	2731	40 8 8	2742	38 32 24	2758
	SUN	E.	63 14 57	2682	61 37 53	2663	60 0 23	2644	58 22 28	2625
3	Antares	W.	76 20 54	2253	78 8 3	2236	79 55 37	2219	81 43 36	2203
	α Aquilæ	W.	33 3 45	3934	34 16 30	3763	35 32 11	3611	36 50 33	3479
	MARS	E.	23 45 6	2590	22 5 58	2593	20 26 54	2603	18 48 3	2620
	SUN	E.	50 6 27	2533	48 25 59	2515	46 45 7	2498	45 3 51	2481
4	Antares	W.	90 49 19	2130	92 39 33	2116	94 30 7	2104	96 21 0	2092
	α Aquilæ	W.	43 55 6	2998	45 25 21	2929	46 57 3	2866	48 30 5	2809
	SUN	E.	36 31 51	2405	34 48 24	2391	33 4 37	2379	31 20 32	2368
5	Antares	W.	105 39 40	2043	107 32 7	2035	109 24 46	2029	111 17 35	2023
	α Aquilæ	W.	56 31 48	2594	58 10 51	2563	59 50 37	2534	61 31 3	2508
	SUN	E.	22 36 18	2322	20 50 51	2317	19 5 17	2315	17 19 39	2315
9	SUN	W.	34 11 42	2431	35 54 32	2447	37 37 0	2463	39 19 5	2479
	Pollux	E.	58 3 35	2253	56 16 26	2274	54 29 48	2295	52 43 41	2317
	Regulus	E.	94 15 45	2145	92 25 54	2159	90 36 25	2174	88 47 19	2190
10	SUN	W.	47 43 39	2566	49 23 20	2585	51 2 35	2604	52 41 24	2623
	Pollux	E.	44 1 57	2451	42 19 35	2482	40 37 57	2516	38 57 6	2553
	Regulus	E.	79 47 54	2274	78 1 17	2293	76 15 7	2311	74 29 23	2329
11	SUN	W.	60 49 0	2721	62 25 12	2741	64 0 57	2761	65 36 16	2781
	Pollux	E.	30 46 40	2785	29 11 53	2848	27 38 27	2919	26 6 32	3000
	Regulus	E.	65 47 30	2424	64 4 29	2443	62 21 56	2462	60 39 50	2482
12	SUN	W.	73 26 25	2879	74 59 11	2898	76 31 32	2918	78 3 28	2936
	Aldebaran	W.	27 52 40	2574	29 32 10	2590	31 11 19	2606	32 50 6	2621
	Regulus	E.	52 16 11	2580	50 36 49	2599	48 57 53	2619	47 19 24	2639
	Spica	E.	105 53 25	2547	104 13 17	2565	102 33 34	2583	100 54 16	2601
13	SUN	W.	85 37 19	3028	87 6 57	3045	88 36 14	3062	90 5 10	3079
	Aldebaran	W.	40 58 44	2700	42 35 24	2715	44 11 44	2730	45 47 44	2745
	JUPITER	W.	23 27 27	2790	25 2 8	2801	26 36 34	2813	28 10 45	2824
	Regulus	E.	39 13 39	2738	37 37 49	2758	36 2 26	2778	34 27 30	2799
	Spica	E.	92 43 39	2686	91 6 40	2701	89 30 2	2717	87 53 45	2733
14	SUN	W.	97 24 50	3157	98 51 50	3172	100 18 32	3187	101 44 57	3201
	Aldebaran	W.	53 42 56	2816	55 17 3	2829	56 50 53	2841	58 24 27	2854
	JUPITER	W.	35 57 47	2886	37 30 24	2898	39 2 46	2910	40 34 52	2922
	Regulus	E.	26 39 49	2913	25 7 47	2941	23 36 20	2970	22 5 30	3002

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	Spica	E.	86° 17′ 49″	2748	84° 42′ 13″	2763	83° 6′ 57″	2778	81° 32′ 0″	2792
15	Sun	W.	103 11 5	3214	104 36 57	3227	106 2 34	3240	107 27 56	3253
	Aldebaran	W.	59 57 45	2868	61 30 47	2879	63 3 33	2890	64 36 5	2901
	Jupiter	W.	42 6 43	2934	43 38 19	2945	45 9 41	2956	46 40 49	2966
	Spica	E.	73 41 47	2859	72 8 35	2870	70 35 38	2882	69 2 56	2894
	Antares	E.	119 0 37	2899	117 28 17	2910	115 56 11	2921	114 24 19	2931
16	Sun	W.	114 31 18	3307	115 55 21	3318	117 19 12	3327	118 42 52	3336
	Aldebaran	W.	72 15 19	2952	73 46 32	2961	75 17 34	2969	76 48 25	2977
	Jupiter	W.	54 13 15	3016	55 43 8	3025	57 12 50	3034	58 42 21	3042
	Pollux	W.	31 26 39	3281	32 51 13	3264	34 16 7	3250	35 41 17	3238
	Spica	E.	61 22 56	2945	59 51 34	2954	58 20 23	2963	56 49 24	2971
	Antares	E.	106 48 8	2979	105 17 29	2988	103 47 1	2996	102 16 43	3004
17	Sun	W.	125 38 46	3375	127 1 31	3382	128 24 8	3389	129 46 37	3396
	Aldebaran	W.	84 20 15	3013	85 50 11	3020	87 19 59	3026	88 49 40	3031
	Jupiter	W.	66 7 35	3078	67 36 12	3083	69 4 42	3090	70 33 4	3095
	Pollux	W.	42 49 59	3203	44 16 5	3198	45 42 16	3194	47 8 32	3191
	Spica	E.	49 16 55	3007	47 46 51	3013	46 16 55	3020	44 47 7	3026
	Antares	E.	94 47 35	3039	93 18 11	3045	91 48 54	3051	90 19 45	3056
18	Aldebaran	W.	96 16 30	3054	97 45 36	3057	99 14 38	3061	100 43 35	3064
	Jupiter	W.	77 53 24	3118	79 21 12	3121	80 48 56	3124	82 16 36	3126
	Pollux	W.	54 20 32	3183	55 47 1	3182	57 13 32	3181	58 40 4	3180
	Spica	E.	37 19 39	3047	35 50 25	3051	34 21 16	3055	32 52 11	3057
	Antares	E.	82 55 32	3080	81 26 58	3083	79 58 28	3087	78 30 3	3091
19	Aldebaran	W.	108 7 33	3075	109 36 13	3077	111 4 51	3078	112 33 28	3079
	Jupiter	W.	89 34 6	3139	91 1 28	3140	92 28 49	3142	93 56 8	3143
	Pollux	W.	65 52 59	3175	67 19 38	3174	68 46 18	3174	70 12 58	3173
	Regulus	W.	28 51 17	3152	30 18 23	3147	31 45 36	3141	33 12 56	3136
	Antares	E.	71 8 54	3104	69 40 49	3106	68 12 47	3108	66 44 47	3110
20	Jupiter	W.	101 12 31	3144	102 39 47	3144	104 7 3	3143	105 34 20	3143
	Pollux	W.	77 26 39	3167	78 53 28	3165	80 20 19	3163	81 47 12	3162
	Regulus	W.	40 30 48	3119	41 58 35	3116	43 26 25	3113	44 54 19	3109
	Antares	E.	59 25 14	3116	57 57 24	3117	56 29 35	3118	55 1 47	3119
	α Aquilæ	E.	110 7 14	3524	108 47 17	3515	107 27 10	3507	106 6 54	3500
21	Jupiter	W.	112 50 59	3138	114 18 23	3136	115 45 49	3133	117 13 18	3131
	Pollux	W.	89 2 4	3153	90 29 9	3152	91 56 16	3150	93 23 25	3148
	Regulus	W.	52 14 44	3095	53 43 0	3091	55 11 20	3089	56 39 43	3085
	Antares	E.	47 43 3	3124	46 15 22	3124	44 47 42	3125	43 20 3	3126
	α Aquilæ	E.	99 23 44	3470	98 2 46	3465	96 41 43	3461	95 20 35	3456
22	Pollux	W.	100 39 50	3137	102 7 15	3135	103 34 42	3133	105 2 12	3130
	Regulus	W.	64 2 44	3068	65 31 33	3064	67 0 27	3060	68 29 26	3056
	Antares	E.	36 2 21	3139	34 34 59	3144	33 7 43	3149	31 40 33	3156
	α Aquilæ	E.	88 33 50	3440	87 12 19	3438	85 50 45	3436	84 29 9	3434
23	Regulus	W.	75 55 38	3034	77 25 9	3030	78 54 45	3025	80 24 27	3019
	Spica	W.	22 2 13	3014	23 32 9	3009	25 2 11	3004	26 32 19	2999

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	Spica	E.	79° 57′ 22″	2806	78° 23′ 2″	2890	76° 49′ 0″	2833	75° 15′ 15″	2846
15	Sun	W.	108 53 3	3264	110 17 56	3276	111 42 36	3287	113 7 3	3297
	Aldebaran	W.	66 8 22	2912	67 40 25	2922	69 12 16	2932	70 43 54	2942
	Jupiter	W.	48 11 44	2977	49 42 26	2987	51 12 55	2997	52 43 11	3007
	Spica	E.	67 30 29	2905	65 58 16	2915	64 26 16	2926	62 54 30	2935
	Antares	E.	112 52 40	2942	111 21 14	2951	109 50 0	2961	108 18 58	2970
16	Sun	W.	120 6 22	3344	121 29 42	3353	122 52 52	3361	124 15 53	3368
	Aldebaran	W.	78 19 6	2985	79 49 37	2993	81 19 58	3000	82 50 11	3007
	Jupiter	W.	60 11 42	3049	61 40 54	3057	63 9 56	3064	64 38 50	3071
	Pollux	W.	37 6 41	3228	38 32 17	3219	39 58 3	3212	41 23 58	3207
	Spica	E.	55 18 35	2979	53 47 56	2987	52 17 27	2994	50 47 7	3001
	Antares	E.	100 46 35	3012	99 16 37	3019	97 46 48	3026	96 17 7	3033
17	Sun	W.	131 8 59	3400	132 31 15	3406	133 53 25	3410	135 15 30	3415
	Aldebaran	W.	90 19 14	3037	91 48 41	3041	93 18 3	3046	94 47 19	3050
	Jupiter	W.	72 1 20	3100	73 29 29	3105	74 57 33	3109	76 25 31	3114
	Pollux	W.	48 34 52	3189	50 1 14	3188	51 27 38	3186	52 54 4	3184
	Spica	E.	43 17 26	3031	41 47 51	3035	40 18 22	3039	38 48 58	3043
	Antares	E.	88 50 42	3062	87 21 46	3067	85 52 56	3071	84 24 11	3076
18	Aldebaran	W.	102 12 29	3066	103 41 20	3069	105 10 7	3072	106 38 51	3074
	Jupiter	W.	83 44 12	3130	85 11 45	3133	86 39 15	3135	88 6 42	3138
	Pollux	W.	60 6 37	3179	61 33 11	3178	62 59 46	3177	64 26 22	3177
	Spica	E.	31 23 9	3060	29 54 11	3063	28 25 16	3065	26 56 24	3067
	Antares	E.	77 1 42	3094	75 33 25	3096	74 5 11	3100	72 37 1	3102
19	Aldebaran	W.	114 2 3	3080	115 30 37	3080	116 59 11	3081	118 27 44	3081
	Jupiter	W.	95 23 26	3143	96 50 43	3144	98 17 59	3144	99 45 15	3144
	Pollux	W.	71 39 39	3172	73 6 22	3171	74 33 6	3169	75 59 52	3168
	Regulus	W.	34 40 22	3133	36 7 52	3129	37 35 26	3125	39 3 5	3122
	Antares	E.	65 16 49	3111	63 48 53	3112	62 20 58	3114	60 53 5	3115
20	Jupiter	W.	107 1 37	3143	108 28 55	3141	109 56 15	3140	111 23 36	3138
	Pollux	W.	83 14 6	3161	84 41 2	3159	86 8 0	3157	87 35 1	3155
	Regulus	W.	46 22 17	3107	47 50 18	3104	49 18 23	3100	50 46 32	3098
	Antares	E.	53 34 0	3119	52 6 14	3120	50 38 29	3121	49 10 45	3123
	α Aquilæ	E.	104 46 30	3494	103 25 59	3488	102 5 21	3481	100 44 36	3475
21	Jupiter	W.	118 40 50	3129	120 8 24	3128	121 36 0	3125	123 3 39	3123
	Pollux	W.	94 50 37	3146	96 17 51	3143	97 45 8	3141	99 12 28	3139
	Regulus	W.	58 8 11	3082	59 36 43	3078	61 5 19	3075	62 33 59	3071
	Antares	E.	41 52 25	3128	40 24 49	3130	38 57 16	3133	37 29 47	3136
	α Aquilæ	E.	93 59 22	3452	92 38 4	3449	91 16 43	3446	89 55 18	3443
22	Pollux	W.	106 29 45	3128	107 57 20	3126	109 24 58	3124	110 52 39	3122
	Regulus	W.	69 58 30	3051	71 27 39	3047	72 56 53	3043	74 26 13	3038
	Antares	E.	30 13 31	3163	28 46 38	3172	27 19 56	3184	25 53 28	3199
	α Aquilæ	E.	83 7 31	3433	81 45 52	3432	80 24 12	3432	79 2 32	3431
23	Regulus	W.	81 54 16	3014	83 24 11	3009	84 54 12	3004	86 24 20	2999
	Spica	W.	28 2 33	2994	29 32 53	2989	31 3 19	2984	32 33 52	2978

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
23	α Aquilæ	E.	77° 40′ 51″	3432	76° 19′ 11″	3433	74° 57′ 32″	3435	73° 35′ 55″	3437
24	Regulus	W.	87 54 34	2993	89 24 55	2987	90 55 24	2981	92 26 0	2976
	Spica	W.	34 4 32	2973	35 35 19	2968	37 6 12	2962	38 37 13	2956
	α Aquilæ	E.	66 48 36	3456	65 27 23	3462	64 6 17	3470	62 45 19	3477
	Fomalhaut	E.	96 9 58	3443	94 48 30	3435	93 26 53	3428	92 5 8	3421
	Venus	E.	119 51 35	3443	118 30 7	3437	117 8 32	3430	115 46 49	3423
25	Regulus	W.	100 0 55	2943	101 32 19	2937	103 3 51	2930	104 35 32	2922
	Spica	W.	46 14 16	2923	47 46 6	2915	49 18 5	2908	50 50 14	2901
	α Aquilæ	E.	56 3 7	3536	54 43 23	3553	53 23 57	3572	52 4 52	3593
	Fomalhaut	E.	85 14 35	3393	83 52 10	3388	82 29 40	3385	81 7 6	3381
	α Pegasi	E.	101 59 7	3087	100 30 41	3078	99 2 5	3069	97 33 18	3061
	Venus	E.	108 56 8	3384	107 33 33	3376	106 10 49	3367	104 47 55	3358
	Mars	E.	115 22 27	3222	113 56 44	3213	112 30 50	3204	111 4 46	3196
26	Spica	W.	58 33 25	2860	60 6 35	2852	61 39 56	2842	63 13 29	2834
	α Aquilæ	E.	45 36 7	3743	44 20 5	3785	43 4 47	3832	41 50 18	3886
	Fomalhaut	E.	74 13 26	3371	72 50 37	3371	71 27 48	3371	70 4 59	3373
	α Pegasi	E.	90 6 45	3017	88 36 54	3009	87 6 53	3001	85 36 41	2993
	Venus	E.	97 50 52	3312	96 26 55	3303	95 2 47	3294	93 38 28	3282
	Mars	E.	103 51 53	3152	102 24 46	3142	100 57 27	3133	99 29 57	3122
	Sun	E.	135 14 13	.3213	133 48 19	3203	132 22 14	3194	130 55 58	3183
27	Spica	W.	71 4 17	2784	72 39 6	2773	74 14 9	2763	75 49 26	2752
	Antares	W.	26 23 16	2942	27 54 42	2915	29 26 42	2891	30 59 12	2869
	Fomalhaut	E.	63 11 41	3394	61 49 18	3402	60 27 4	3412	59 5 1	3423
	α Pegasi	E.	78 3 3	2950	76 31 48	2942	75 0 22	2934	73 28 46	2925
	Venus	E.	86 33 43	3228	85 8 7	3216	83 42 17	3204	82 16 13	3193
	Mars	E.	92 9 16	3069	90 40 28	3057	89 11 26	3046	87 42 10	3034
	Sun	E.	123 41 28	3129	122 13 54	3119	120 46 7	3107	119 18 6	3095
28	Spica	W.	83 49 35	2693	85 26 24	2680	87 3 30	2668	88 40 53	2655
	Antares	W.	38 48 26	2772	40 23 30	2754	41 58 58	2738	43 34 48	2720
	Fomalhaut	E.	52 18 39	3511	50 58 27	3536	49 38 43	3566	48 19 32	3600
	α Pegasi	E.	65 48 11	2887	64 15 35	2879	62 42 49	2873	61 9 55	2866
	Venus	E.	75 2 11	3128	73 34 36	3114	72 6 44	3101	70 38 36	3087
	Mars	E.	80 12 4	2971	78 41 15	2958	77 10 10	2945	75 38 48	2931
	Sun	E.	111 54 14	3031	110 24 40	3017	108 54 49	3004	107 24 41	2990
29	Spica	W.	96 52 13	2587	98 31 25	2574	100 10 56	2559	101 50 47	2545
	Antares	W.	51 39 31	2638	53 17 34	2623	54 55 58	2607	56 34 44	2590
	Fomalhaut	E.	41 54 43	3859	40 40 42	3934	39 27 57	4022	38 16 39	4121
	α Pegasi	E.	53 23 37	2843	51 50 5	2841	50 16 31	2840	48 42 55	2841
	Venus	E.	63 13 35	3015	61 43 41	3000	60 13 28	2985	58 42 57	2970
	Mars	E.	67 57 34	2861	66 24 25	2846	64 50 57	2831	63 17 9	2815
	Sun	E.	99 49 36	2917	98 17 39	2902	96 45 23	2887	95 12 47	2872
30	Antares	W.	64 54 9	2510	66 35 8	2494	68 16 30	2477	69 58 15	2462
	α Pegasi	E.	40 55 49	2872	39 22 54	2887	37 50 19	2907	36 18 9	2931
	Venus	E.	51 5 33	2893	49 33 5	2877	48 0 17	2862	46 27 10	2847
	Mars	E.	55 23 12	2739	53 47 24	2724	52 11 16	2708	50 34 47	2693
	Sun	E.	87 24 46	2792	85 50 8	2775	84 15 8	2759	82 39 46	2742

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	α Aquilæ	E.	72° 14′ 20″	3439	70° 52′ 48″	3442	69° 31′ 19″	3446	68° 9′ 55″	3451
24	Regulus	W.	93 56 43	2969	95 27 34	2963	96 58 33	2957	98 29 40	2950
	Spica	W.	40 8 21	2950	41 39 37	2943	43 11 2	2936	44 42 35	2930
	α Aquilæ	E.	61 24 29	3486	60 3 49	3497	58 43 21	3509	57 23 7	3522
	Fomalhaut	E.	90 43 15	3415	89 21 15	3408	87 59 8	3402	86 36 54	3398
	Venus	E.	114 24 58	3415	113 2 59	3407	111 40 51	3400	110 18 34	3392
25	Regulus	W.	106 7 23	2915	107 39 23	2908	109 11 32	2900	110 43 51	2892
	Spica	W.	52 22 32	2893	53 55 0	2885	55 27 38	2877	57 0 26	2869
	α Aquilæ	E.	50 46 10	3617	49 27 54	3643	48 10 6	3672	46 52 49	3705
	Fomalhaut	E.	79 44 28	3378	78 21 46	3375	76 59 1	3373	75 36 14	3372
	α Pegasi	E.	96 4 21	3052	94 35 13	3043	93 5 54	3035	91 36 25	3026
	Venus	E.	103 24 51	3350	102 1 37	3341	100 38 13	3331	99 14 38	3322
	Mars	E.	109 38 32	3188	108 12 8	3179	106 45 34	3170	105 18 49	3161
26	Spica	W.	64 47 13	2824	66 21 10	2814	67 55 19	2804	69 29 41	2794
	α Aquilæ	E.	40 36 44	3946	39 24 11	4015	38 12 46	4092	37 2 37	4182
	Fomalhaut	E.	68 42 12	3376	67 19 28	3379	65 56 47	3383	64 34 11	3388
	α Pegasi	E.	84 6 19	2984	82 35 46	2975	81 5 2	2967	80 34 8	2958
	Venus	E.	92 13 56	3272	90 49 12	3261	89 24 15	3251	87 59 6	3239
	Mars	E.	98 2 14	3112	96 34 19	3101	95 6 11	3091	93 37 50	3080
	Sun	E.	129 29 29	3173	128 2 48	3162	126 35 54	3152	125 8 48	3141
27	Spica	W.	77 24 57	2741	79 0 43	2729	80 36 45	2717	82 13 2	2705
	Antares	W.	32 32 11	2848	34 5 37	2828	35 39 28	2808	37 13 45	2790
	Fomalhaut	E.	57 43 11	3436	56 21 35	3451	55 0 16	3468	53 39 16	3488
	α Pegasi	E.	71 56 59	2917	70 25 2	2909	68 52 55	2901	67 20 38	2894
	Venus	E.	80 49 55	3180	79 23 22	3167	77 56 34	3154	76 29 30	3142
	Mars	E.	86 12 39	3022	84 42 53	3009	83 12 52	2997	81 42 36	2985
	Sun	E.	117 49 50	3082	116 21 19	3070	114 52 33	3058	113 23 32	3044
28	Spica	W.	90 18 33	2642	91 56 31	2629	93 34 46	2615	95 13 20	2601
	Antares	W.	45 11 1	2704	46 47 36	2688	48 24 32	2672	50 1 50	2654
	Fomalhaut	E.	47 0 58	3639	45 43 6	3684	44 26 2	3735	43 9 52	3793
	α Pegasi	E.	59 36 53	2860	58 3 43	2855	56 30 27	2851	54 57 5	2846
	Venus	E.	69 10 11	3073	67 41 29	3059	66 12 29	3044	64 43 11	3030
	Mars	E.	74 7 9	2917	72 35 12	2904	71 2 58	2889	69 30 25	2875
	Sun	E.	105 54 16	2977	104 23 34	2961	102 52 33	2947	101 21 14	2932
29	Spica	W.	103 30 57	2531	105 11 27	2516	106 52 18	2501	108 33 30	2487
	Antares	W.	58 13 53	2574	59 53 24	2558	61 33 17	2542	63 13 32	2526
	Fomalhaut	E.	37 6 58	4236	35 59 6	4369	34 53 17	4524	33 49 46	4703
	α Pegasi	E.	47 9 20	2842	45 35 47	2846	44 2 19	2852	42 28 59	2860
	Venus	E.	57 12 7	2955	55 40 58	2939	54 9 29	2924	52 37 41	2909
	Mars	E.	61 43 1	2801	60 8 34	2785	58 33 47	2770	56 58 40	2754
	Sun	E.	93 39 52	2855	92 6 36	2840	90 33 0	2824	88 59 3	2808
30	Antares	W.	71 40 22	2445	73 22 52	2430	75 5 44	2414	76 48 59	2398
	α Pegasi	E.	34 46 29	2961	33 15 27	2999	31 45 13	3047	30 15 58	3105
	Venus	E.	44 53 43	2832	43 19 56	2817	41 45 50	2802	40 11 25	2788
	Mars	E.	48 57 58	2677	47 20 48	2662	45 43 17	2647	44 5 26	2632
	Sun	E.	81 4 2	2725	79 27 56	2710	77 51 29	2694	76 14 41	2677

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	2 33 16.66	9.541	N.15 3 21.5	+45.42	15 54.26	66.05	3 0.26	0.315
Wed.	2	2 37 5.92	9.564	15 21 24.0	44.80	15 54.02	66.13	3 7.54	0.292
Thur.	3	2 40 55.74	9.587	15 39 11.4	44.16	15 53.78	66.21	3 14.26	0.269
Frid.	4	2 44 46.12	9.611	15 56 43.5	+43.50	15 53.55	66.29	3 20.42	0.245
Sat.	5	2 48 37.07	9.634	16 13 59.7	42.84	15 53.32	66.37	3 26.01	0.222
Sun.	6	2 52 28.59	9.658	16 30 59.8	42.16	15 53.10	66.45	3 31.03	0.198
Mon.	7	2 56 20.68	9.682	16 47 43.5	+41.47	15 52.88	66.53	3 35.49	0.175
Tues.	8	3 0 13.34	9.706	17 4 10.3	40.76	15 52.65	66.61	3 39.38	0.151
Wed.	9	3 4 6.56	9.729	17 20 20.1	40.05	15 52.44	66.69	3 42.70	0.128
Thur.	10	3 8 0.35	9.753	17 36 12.6	+39.32	15 52.23	66.77	3 45.45	0.104
Frid.	11	3 11 54.70	9.776	17 51 47.3	38.57	15 52.02	66.85	3 47.64	0.081
Sat.	12	3 15 49.61	9.800	18 7 4.1	37.81	15 51.82	66.94	3 49.29	0.057
Sun.	13	3 19 45.08	9.823	18 22 2.6	+37.05	15 51.62	67.02	3 50.38	0.034
Mon.	14	3 23 41.11	9.846	18 36 42.6	36.27	15 51.43	67.10	3 50.91	0.011
Tues.	15	3 27 37.69	9.869	18 51 3.8	35.48	15 51.23	67.18	3 50.88	0.012
Wed.	16	3 31 34.83	9.892	19 5 6.0	+34.68	15 51.04	67.27	3 50.29	0.035
Thur.	17	3 35 32.52	9.915	19 18 48.7	33.88	15 50.85	67.35	3 49.16	0.058
Frid.	18	3 39 30.75	9.938	19 32 11.8	33.05	15 50.67	67.43	3 47.48	0.081
Sat.	19	3 43 29.53	9.961	19 45 15.0	+32.21	15 50.49	67.51	3 45.26	0.104
Sun.	20	3 47 28.85	9.983	19 57 58.1	31.36	15 50.31	67.59	3 42.51	0.126
Mon.	21	3 51 28.71	10.005	20 10 20.8	30.51	15 50.13	67.68	3 39.21	0.148
Tues.	22	3 55 29.10	10.028	20 22 22.7	+29.65	15 49.95	67.75	3 35.38	0.170
Wed.	23	3 59 30.04	10.050	20 34 3.8	28.77	15 49.78	67.83	3 31.01	0.192
Thur.	24	4 3 31.51	10.072	20 45 23.8	27.88	15 49.61	67.90	3 26.11	0.214
Frid.	25	4 7 33.50	10.094	20 56 22.5	+26.98	15 49.44	67.97	3 20.69	0.237
Sat.	26	4 11 36.00	10.115	21 6 59.5	26.09	15 49.27	68.04	3 14.76	0.258
Sun.	27	4 15 39.01	10.136	21 17 14.8	25.17	15 49.11	68.11	3 8.33	0.278
Mon.	28	4 19 42.52	10.156	21 27 8.0	+24.25	15 48.95	68.17	3 1.40	0.298
Tues.	29	4 23 46.51	10.176	21 36 39.1	23.32	15 48.80	68.23	2 53.99	0.318
Wed.	30	4 27 50.96	10.195	21 45 47.7	22.38	15 48.65	68.29	2 46.11	0.337
Thur.	31	4 31 55.87	10.214	21 54 33.7	21.44	15 48.50	68.35	2 37.77	0.356
Frid.	32	4 36 1.23	10.232	N.22 2 56.9	+20.48	15 48.36	68.41	2 28.99	0.374

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	2 33 17.14	9.542	N. 15 3 23.8	+45.42	3 0.28	0.315	2 36 17.43
Wed.	2	2 37 6.42	9.565	15 21 26.4	44.80	3 7.56	0.292	2 40 13.98
Thur.	3	2 40 56.26	9.588	15 39 13.9	44.16	3 14.28	0.269	2 44 10.54
Frid.	4	2 44 46.66	9.612	15 56 46.0	+43.50	3 20.43	0.245	2 48 7.09
Sat.	5	2 48 37.63	9.635	16 14 2.2	42.84	3 26.02	0.222	2 52 3.65
Sun.	6	2 52 29.16	9.659	16 31 2.3	42.16	3 31.04	0.198	2 56 0.20
Mon.	7	2 56 21.26	9.682	16 47 46.0	+41.47	3 35.50	0.175	2 59 56.76
Tues.	8	3 0 13.93	9.706	17 4 12.8	40.76	3 39.39	0.151	3 3 53.31
Wed.	9	3 4 7.16	9.729	17 20 22.6	40.05	3 42.71	0.128	3 7 49.87
Thur.	10	3 8 0.96	9.753	17 36 15.1	+39.32	3 45.46	0.104	3 11 46.42
Frid.	11	3 11 55.32	9.776	17 51 49.8	38.57	3 47.65	0.081	3 15 42.98
Sat.	12	3 15 50.24	9.800	18 7 6.5	37.81	3 49.29	0.057	3 19 39.53
Sun.	13	3 19 45.71	9.823	18 22 5.0	+37.05	3 50.38	0.034	3 23 36.09
Mon.	14	3 23 41.74	9.846	18 36 44.9	36.27	3 50.91	0.011	3 27 32.64
Tues.	15	3 27 38.32	9.869	18 51 6.1	35.48	3 50.88	0.012	3 31 29.20
Wed.	16	3 31 35.46	9.892	19 5 8.2	+34.68	3 50.29	0.035	3 35 25.75
Thur.	17	3 35 33.15	9.915	19 18 50.9	33.88	3 49.16	0.058	3 39 22.31
Frid.	18	3 39 31.38	9.938	19 32 13.9	33.05	3 47.48	0.081	3 43 18.86
Sat.	19	3 43 30.15	9.961	19 45 17.0	+32.21	3 45.26	0.104	3 47 15.42
Sun.	20	3 47 29.47	9.983	19 58 0.0	31.36	3 42.50	0.126	3 51 11.97
Mon.	21	3 51 29.32	10.005	20 10 22.6	30.52	3 39.20	0.148	3 55 8.52
Tues.	22	3 55 29.70	10.027	20 22 24.5	+29.65	3 35.37	0.170	3 59 5.07
Wed.	23	3 59 30.63	10.049	20 34 5.5	28.77	3 31.00	0.192	4 3 1.63
Thur.	24	4 3 32.09	10.071	20 45 25.4	27.88	3 26.10	0.214	4 6 58.19
Frid.	25	4 7 34.06	10.094	20 56 24.0	+26.98	3 20.68	0.237	4 10 54.75
Sat.	26	4 11 36.55	10.115	21 7 0.9	26.09	3 14.75	0.258	4 14 51.30
Sun.	27	4 15 39.54	10.135	21 17 16.0	25.17	3 8.32	0.278	4 18 47.86
Mon.	28	4 19 43.03	10.155	21 27 9.2	+24.25	3 1.39	0.298	4 22 44.42
Tues.	29	4 23 47.00	10.175	21 36 40.2	23.32	2 53.98	0.318	4 26 40.98
Wed.	30	4 27 51.43	10.194	21 45 48.7	22.38	2 46.10	0.337	4 30 37.53
Thur.	31	4 31 56.32	10.213	21 54 34.6	21.44	2 37.76	0.356	4 34 34.09
Frid.	32	4 36 1.66	10.231	N. 22 2 57.7	+20.48	2 28.98	0.374	4 38 30.64

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, $+ 9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	121	40 45 5.8	44 38.7	145.48	+ 0.72	0.0035077	+ 45.9	21 20 12.27
2	122	41 43 16.6	42 49.4	145.42	0.66	0.0036173	45.3	21 16 16.36
3	123	42 41 25.9	40 58.6	145.36	0.56	0.0037255	44.7	21 12 20.45
4	124	43 39 33.8	39 6.4	145.30	+ 0.46	0.0038321	+ 44.1	21 8 24.54
5	125	44 37 40.2	37 12.6	145.24	0.33	0.0039370	43.4	21 4 28.63
6	126	45 35 45.0	35 17.3	145.17	0.20	0.0040402	42.6	21 0 32.72
7	127	46 33 48.1	33 20.3	145.10	+ 0.06	0.0041415	+ 41.9	20 56 36.81
8	128	47 31 49.6	31 21.7	145.03	— 0.07	0.0042410	41.1	20 52 40.90
9	129	48 29 49.4	29 21.3	144.96	0.18	0.0043386	40.4	20 48 44.99
10	130	49 27 47.5	27 19.2	144.88	— 0.29	0.0044344	+ 39.6	20 44 49.08
11	131	50 25 43.8	25 15.4	144.81	0.36	0.0045284	38.9	20 40 53.18
12	132	51 23 38.5	23 10.0	144.74	0.41	0.0046207	38.2	20 36 57.27
13	133	52 21 31.4	21 2.8	144 67	— 0.44	0.0047114	+ 37.5	20 33 1.36
14	134	53 19 22.5	18 53.8	144.59	0.42	0.0048006	36.9	20 29 5.45
15	135	54 17 11.8	16 42.9	144.52	0.37	0.0048884	36.2	20 25 9.54
16	136	55 14 59.4	14 30.4	144.45	— 0.30	0.0049750	+ 35.8	20 21 13.63
17	137	56 12 45.3	12 16.2	144.38	0.19	0.0050603	35.3	20 17 17.72
18	138	57 10 29.7	10 0.5	144.32	— 0.09	0.0051445	34.9	20 13 21 81
19	139	58 8 12.6	7 43.2	144.25	+ 0.04	0 0052277	+ 34.4	20 9 25.91
20	140	59 5 54.0	5 24.4	144.19	0.17	0.0053099	34.0	20 5 30.00
21	141	60 3 34.0	3 4.2	144.13	0.31	0.0053911	33.6	20 1 34.09
22	142	61 1 12.6	0 42.7	144.08	+ 0.42	0.0054713	+ 33.2	19 57 38.18
23	143	61 58 50.0	58 20.0	144.03	0.52	0.0055505	32.8	19 53 42.27
24	144	62 56 26.3	55 56.1	143.99	0.61	0.0056286	32.3	19 49 46.36
25	145	63 54 1.6	53 31.2	143.95	+ 0.66	0.0057056	+ 31.8	19 45 50.45
26	146	64 51 35.9	51 5.4	143.91	0.68	0.0057814	31.3	19 41 54.54
27	147	65 49 9.3	48 38.7	143.87	0.68	0.0058559	30.7	19 37 58.63
28	148	66 46 41.8	46 11.0	143.84	+ 0.64	0.0059288	+ 30.0	19 34 2.72
29	149	67 44 13.5	43 42.5	143.80	0.58	0.0060001	29.3	19 30 6.81
30	150	68 41 44.4	41 13.2	143.77	0.51	0.0060696	28.6	19 26 10.90
31	151	69 39 14.5	38 43.2	143.74	0.39	0.0061372	27.7	19 22 14.99
32	152	70 36 43.8	36 12.4	143.71	+ 0.27	0.0062027	+ 26.8	19 18 19.07

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 3.8	16 10.2	58 50.4	+2.00	59 14.1	+1.94	19 51.7	2.17	23.9
2	16 16.4	16 22.3	59 36.9	1.85	59 58.3	1.70	20 44.1	2.21	24.9
3	16 27.5	16 32.0	60 17.6	1.50	60 34.2	1.25	21 38.0	2.29	25.9
4	16 35.7	16 38.3	60 47.5	+0.95	60 57.1	+0.62	22 34.0	2.38	26.9
5	16 39.8	16 40.0	61 2.5	+0.27	61 3.4	−0.12	23 32.1	2.47	27.9
6	16 39.0	16 36.7	60 59.7	−0.50	60 51.4	0.87	δ		28.9
7	16 33.3	16 28.8	60 38.8	−1.22	60 22.1	−1.54	0 32.0	2.52	0.6
8	16 23.3	16 17.0	60 1.9	1.81	59 38.8	2.02	1 32.4	2.51	1.6
9	16 10.0	16 2.7	59 13.4	2.18	58 46.4	2.30	2 31.9	2.43	2.6
10	15 55.1	15 47.4	58 18.5	−2.35	57 50.2	−2.35	3 28.8	2.29	3.6
11	15 39.8	15 32.4	57 22.3	2.30	56 55.1	2.21	4 22.4	2.15	4.6
12	15 25.3	15 18.7	56 29.2	2.09	56 4.9	1.95	5 12.4	2.02	5.6
13	15 12.6	15 7.1	55 42.5	−1.78	55 22.2	−1.60	5 59.3	1.90	6.6
14	15 2.2	14 57.9	55 4.1	1.41	54 48.4	1.21	6 43.8	1.81	7.6
15	14 54.3	14 51.3	54 35.2	1.00	54 24.3	0.80	7 26.6	1.76	8.6
16	14 49.0	14 47.4	54 15.9	−0.60	54 9.9	−0.42	8 8.6	1.75	9.6
17	14 46.3	14 45.8	54 5.8	−0.24	54 4.0	−0.07	8 50.7	1.76	10.6
18	14 45.9	14 46.4	54 4.2	+0.09	54 6.2	+0.24	9 33.5	1.81	11.6
19	14 47.4	14 48.9	54 10.0	+0.37	54 15.3	+0.50	10 17.7	1.88	12.6
20	14 50.7	14 52.9	54 22.1	0.62	54 30.1	0.72	11 3.6	1.95	13.6
21	14 55.4	14 58.2	54 39.3	0.81	54 49.5	0.88	11 51.4	2.03	14.6
22	15 1.2	15 4.5	55 0.6	+0.96	55 12.5	+1.02	12 40.9	2.10	15.6
23	15 7.9	15 11.5	55 25.2	1.08	55 38.5	1.13	13 31.7	2.14	16.6
24	15 15.3	15 19.3	55 52.5	1.19	56 7.1	1.24	14 23.2	2.15	17.6
25	15 23.5	15 27.7	56 22.3	+1.28	56 38.0	+1.33	15 14.8	2.14	18.6
26	15 32.2	15 36.7	56 54.3	1.37	57 11.0	1.41	16 5.8	2.11	19.6
27	15 41.4	15 46.2	57 28.2	1.45	57 45.8	1.47	16 56.3	2.09	20.6
28	15 51.0	15 55.9	58 3.6	+1.48	58 21.4	+1.48	17 46.5	2.09	21.6
29	16 0.7	16 5.5	58 39.2	1.47	58 56.6	1.42	18 37.0	2.12	22.6
30	16 10.0	16 14.4	59 13.4	1.36	59 29.2	1.26	19 28.4	2.17	23.6
31	16 18.2	16 21.7	59 43.5	1.12	59 56.1	0.96	20 21.5	2.26	24.6
32	16 24.5	16 26.7	60 6.5	+0.76	60 14.4	+0.53	21 16.8	2.36	25.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
		TUESDAY 1.					THURSDAY 3.		
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 46 42.54	2.2305	S. 7 58 25.3	10.861	0	23 35 11.87	2.3051	N. 1 30 4.4	12.383
1	21 48 56.39	2.2312	7 47 31.9	10.918	1	23 37 30.25	2.3076	1 42 27.5	12.385
2	21 51 10.28	2.2319	7 36 35.2	10.973	2	23 39 48.78	2.3102	1 54 50.6	12.385
3	21 53 24.22	2.2327	7 25 35.2	11.028	3	23 42 7.47	2.3128	2 7 13.7	12.384
4	21 55 38.20	2.2334	7 14 31.9	11.083	4	23 44 26.32	2.3155	2 19 36.7	12.382
5	21 57 52.23	2.2342	7 3 25.3	11.136	5	23 46 45.33	2.3181	2 31 59.5	12.377
6	22 0 6.30	2.2350	6 52 15.6	11.188	6	23 49 4.49	2.3208	2 44 21.9	12.370
7	22 2 20.43	2.2359	6 41 2.8	11.239	7	23 51 23.82	2.3236	2 56 43.9	12.363
8	22 4 34.61	2.2368	6 29 46.9	11.290	8	23 53 43.32	2.3263	3 9 5.5	12.356
9	22 6 48.84	2.2377	6 18 28.0	11.339	9	23 56 2.98	2.3291	3 21 26.6	12.346
10	22 9 3.13	2.2387	6 7 6.2	11.387	10	23 58 22.81	2.3320	3 33 47.0	12.333
11	22 11 17.48	2.2397	5 55 41.5	11.434	11	0 0 42.82	2.3350	3 46 6.6	12.320
12	22 13 31.89	2.2407	5 44 14.1	11.480	12	0 3 3.01	2 3379	3 58 25.4	12.306
13	22 15 46.37	2.2418	5 32 43.9	11.526	13	0 5 23.37	2.3408	4 10 43.3	12.290
14	22 18 0.91	2.2429	5 21 11.0	11.571	14	0 7 43.91	2.3438	4 23 0.2	12.272
15	22 20 15.52	2.2441	5 9 35.4	11.614	15	0 10 4.63	2.3468	4 35 15.9	12.252
16	22 22 30.20	2.2453	4 57 57.3	11.654	16	0 12 25.53	2.3498	4 47 30.4	12.232
17	22 24 44.95	2.2465	4 46 16.7	11.697	17	0 14 46.61	2.3529	4 59 43.7	12.210
18	22 26 59.78	2.2478	4 34 33.6	11.737	18	0 17 7.88	2.3561	5 11 55.6	12.186
19	22 29 14.68	2.2491	4 22 48.2	11.776	19	0 19 29.34	2.3592	5 24 6.0	12.161
20	22 31 29.67	2.2505	4 11 0.5	11.814	20	0 21 50.99	2.3623	5 36 14.9	12.134
21	22 33 44.74	2.2519	3 59 10.5	11.852	21	0 24 12.82	2.3655	5 48 22.1	12.105
22	22 35 59.90	2.2534	3 47 18.3	11.888	22	0 26 34.85	2.3687	6 0 27.5	12.075
23	22 38 15.15	2.2548	S. 3 35 24.0	11.921	23	0 28 57.07	2.3719	N. 6 12 31.1	12.044
		WEDNESDAY 2.					FRIDAY 4.		
0	22 40 30.48	2.2563	S. 3 23 27.8	11.953	0	0 31 19.48	2.3752	N. 6 24 32.8	12.012
1	22 42 45.91	2.2579	3 11 29.6	11.986	1	0 33 42.09	2.3785	6 36 32.5	11.977
2	22 45 1.43	2.2595	2 59 29.5	12.017	2	0 36 4.90	2.3818	6 48 30.0	11.940
3	22 47 17.05	2.2612	2 47 27.5	12.047	3	0 38 27.91	2.3852	7 0 25.3	11.902
4	22 49 32.77	2.2628	2 35 23.8	12.076	4	0 40 51.12	2.3885	7 12 18.3	11.863
5	22 51 48.59	2.2645	2 23 18.4	12.103	5	0 43 14.53	2.3918	7 24 8.9	11.822
6	22 54 4.51	2.2662	2 11 11.4	12.130	6	0 45 38.14	2.3952	7 35 56.9	11.779
7	22 56 20.54	2.2681	1 59 2.8	12.155	7	0 48 1.96	2.3987	7 47 42.3	11.735
8	22 58 36.68	2.2700	1 46 52.8	12.178	8	0 50 25.98	2.4020	7 59 25.1	11.690
9	23 0 52.94	2.2719	1 34 41.4	12.201	9	0 52 50.20	2.4054	8 11 5.1	11.642
10	23 3 9.31	2.2738	1 22 28.7	12.222	10	0 55 14.63	2.4088	8 22 42.2	11.593
11	23 5 25.80	2.2757	1 10 14.7	12.242	11	0 57 39.26	2.4122	8 34 16.3	11.542
12	23 7 42.40	2.2777	0 57 59.6	12.261	12	1 0 4.10	2.4157	8 45 47.3	11.491
13	23 9 59.13	2.2798	0 45 43.4	12.278	13	1 2 29.15	2.4192	8 57 15.2	11.437
14	23 12 15.98	2.2819	0 33 26.2	12.295	14	1 4 54.41	2.4227	9 8 39.8	11.382
15	23 14 32.96	2.2841	0 21 8.0	12.310	15	1 7 19.87	2.4261	9 20 1.0	11.324
16	23 16 50.07	2.2862	S. 0 8 49.1	12.323	16	1 9 45.54	2.4296	9 31 18.7	11.266
17	23 19 7.31	2.2884	N. 0 3 30.8	12.336	17	1 12 11.42	2.4331	9 42 32.9	11.207
18	23 21 24.68	2.2907	0 15 51.3	12.347	18	1 14 37.51	2.4366	9 53 43.5	11.145
19	23 23 42.19	2.2930	0 28 12.4	12.357	19	1 17 3.81	2.4401	10 4 50.3	11.082
20	23 25 59.84	2.2953	0 40 34.1	12.365	20	1 19 30.32	2.4435	10 15 53.3	11.017
21	23 28 17.63	2.2977	0 52 56.2	12.372	21	1 21 57.03	2.4469	10 26 52.3	10.950
22	23 30 35.56	2.3001	1 5 18.7	12.377	22	1 24 23.95	2.4504	10 37 47.3	10.882
23	23 32 53.64	2.3026	1 17 41.5	12.381	23	1 26 51.08	2.4539	10 48 38.2	10.812
24	23 35 11.87	2.3051	N. 1 30 4.4	12.383	24	1 29 18.42	2.4574	N. 10 59 24.8	10.741

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 5.					**MONDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 29 18.42	2.4574	N.10 59 24.8	10.741	0	3 30 39.57	2.5790	N.17 45 49.6	5.717
1	1 31 45.97	2.4608	11 10 7.1	10.668	1	3 33 14.34	2.5799	17 51 28.7	5.586
2	1 34 13.72	2.4642	11 20 45.0	10.595	2	3 35 49.16	2.5807	17 56 59.9	5.455
3	1 36 41.67	2.4676	11 31 18.5	10.519	3	3 38 24.03	2.5814	18 2 23.3	5.323
4	1 39 9.83	2.4710	11 41 47.3	10.441	4	3 40 58.93	2.5821	18 7 38.7	5.190
5	1 41 38.19	2.4744	11 52 11.4	10.362	5	3 43 33.87	2.5826	18 12 46.1	5.057
6	1 44 6.76	2.4778	12 2 30.8	10.282	6	3 46 8.84	2.5830	18 17 45.5	4.923
7	1 46 35.53	2.4812	12 12 45.3	10.200	7	3 48 43.83	2.5833	18 22 36.8	4.788
8	1 49 4.50	2.4844	12 22 54.8	10.117	8	3 51 18.84	2.5837	18 27 20.1	4.654
9	1 51 33.66	2.4877	12 32 59.3	10.032	9	3 53 53.87	2.5839	18 31 55.3	4.518
10	1 54 3.02	2.4910	12 42 58.7	9.946	10	3 56 28.91	2.5839	18 36 22.3	4.383
11	1 56 32.58	2.4942	12 52 52.8	9.858	11	3 59 3.94	2.5838	18 40 41.2	4.248
12	1 59 2.33	2.4974	13 2 41.6	9.768	12	4 1 38.96	2.5836	18 44 52.0	4.112
13	2 1 32.27	2.5006	13 12 25.0	9.677	13	4 4 13.97	2.5834	18 48 54.6	3.974
14	2 4 2.40	2.5037	13 22 2.9	9.585	14	4 6 48.97	2.5831	18 52 48.9	3.837
15	2 6 32.72	2.5069	13 31 35.2	9.492	15	4 9 23.94	2.5826	18 56 35.0	3.699
16	2 9 3.23	2.5101	13 41 1.9	9.397	16	4 11 58.88	2.5821	19 0 12.8	3.562
17	2 11 33.93	2.5132	13 50 22.8	9.300	17	4 14 33.79	2.5814	19 3 42.4	3.424
18	2 14 4.81	2.5162	13 59 37.9	9.202	18	4 17 8.65	2.5806	19 7 3.7	3.286
19	2 16 35.87	2.5191	14 8 47.1	9.103	19	4 19 43.46	2.5797	19 10 16.7	3.148
20	2 19 7.10	2.5220	14 17 50.3	9.003	20	4 22 18.22	2.5788	19 13 21.4	3.010
21	2 21 38.51	2.5249	14 26 47.4	8.901	21	4 24 52.92	2.5777	19 16 17.9	2.872
22	2 24 10.09	2.5277	14 35 38.4	8.797	22	4 27 27.55	2.5766	19 19 6.0	2.733
23	2 26 41.83	2.5304	N.14 44 23.1	8.692	23	4 30 2.11	2.5753	N.19 21 45.8	2.595
	SUNDAY 6.					**TUESDAY 8.**			
0	2 29 13.74	2.5332	N.14 53 1.5	8.587	0	4 32 36.59	2.5739	N.19 24 17.4	2.457
1	2 31 45.81	2.5358	15 1 33.5	8.480	1	4 35 10.98	2.5725	19 26 40.7	2.318
2	2 34 18.04	2.5385	15 9 59.1	8.372	2	4 37 45.29	2.5710	19 28 55.6	2.179
3	2 36 50.43	2.5411	15 18 18.1	8.262	3	4 40 19.50	2.5692	19 31 2.2	2.041
4	2 39 22.97	2.5436	15 26 30.5	8.151	4	4 42 53.60	2.5674	19 33 0.5	1.903
5	2 41 55.66	2.5461	15 34 36.2	8.039	5	4 45 27.59	2.5656	19 34 50.5	1.765
6	2 44 28.50	2.5485	15 42 35.2	7.927	6	4 48 1.47	2.5637	19 36 32.3	1.627
7	2 47 1.48	2.5508	15 50 27.4	7.812	7	4 50 35.23	2.5616	19 38 5.8	1.490
8	2 49 34.59	2.5530	15 58 12.6	7.696	8	4 53 8.86	2.5593	19 39 31.1	1.352
9	2 52 7.84	2.5552	16 5 50.9	7.580	9	4 55 42.35	2.5570	19 40 48.1	1.215
10	2 54 41.22	2.5573	16 13 22.2	7.462	10	4 58 15.70	2.5547	19 41 56.9	1.078
11	2 57 14.72	2.5593	16 20 46.4	7.343	11	5 0 48.91	2.5522	19 42 57.5	0.941
12	2 59 48.34	2.5613	16 28 3.4	7.223	12	5 3 21.97	2.5497	19 43 49.8	0.804
13	3 2 22.08	2.5632	16 35 13.2	7.103	13	5 5 54.87	2.5470	19 44 33.9	0.668
14	3 4 55.93	2.5651	16 42 15.8	6.981	14	5 8 27.61	2.5442	19 45 10.0	0.534
15	3 7 29.89	2.5668	16 49 11.0	6.858	15	5 11 0.18	2.5413	19 45 38.0	0.399
16	3 10 3.95	2.5685	16 55 58.8	6.735	16	5 13 32.57	2.5384	19 45 57.9	0.264
17	3 12 38.11	2.5702	17 2 39.2	6.612	17	5 16 4.79	2.5354	19 46 9.7	+ 0.129
18	3 15 12.37	2.5717	17 9 12.2	6.487	18	5 18 36.82	2.5323	19 46 13.4	− 0.005
19	3 17 46.71	2.5730	17 15 37.6	6.360	19	5 21 8.66	2.5291	19 46 9.1	0.138
20	3 20 21.13	2.5744	17 21 55.4	6.232	20	5 23 40.31	2.5257	19 45 56.9	0.270
21	3 22 55.64	2.5757	17 28 5.5	6.105	21	5 26 11.75	2.5222	19 45 36.7	0.402
22	3 25 30.22	2.5768	17 34 8.0	5.977	22	5 28 42.98	2.5188	19 45 8.6	0.534
23	3 28 4.86	2.5779	17 40 2.7	5.847	23	5 31 14.01	2.5153	19 44 32.6	0.665
24	3 30 39.57	2.5790	N.17 45 49.6	5.717	24	5 33 44.82	2.5117	N.19 43 48.8	0.795

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 9.					FRIDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 33 44.82	2.5117	N.19 43 48.8	0.795	0	7 28 55.37	2.2720	N.16 50 53.5	6.042
1	5 36 15.41	2.5079	19 42 57.2	0.925	1	7 31 11.52	2.2664	16 44 48.4	6.127
2	5 38 45.77	2.5041	19 41 57.8	1.055	2	7 33 27.34	2.2608	16 38 38.2	6.212
3	5 41 15.90	2.5002	19 40 50.6	1.183	3	7 35 42.82	2.2552	16 32 23.0	6.294
4	5 43 45.79	2.4962	19 39 35.8	1.311	4	7 37 57.97	2.2496	16 26 2.9	6.376
5	5 46 15.44	2.4922	19 38 13.3	1.438	5	7 40 12.78	2.2440	16 19 37.9	6.456
6	5 48 44.85	2.4881	19 36 43.2	1.565	6	7 42 27.25	2.2383	16 13 8.2	6.534
7	5 51 14.01	2.4838	19 35 5.5	1.690	7	7 44 41.38	2.2328	16 6 33.8	6.613
8	5 53 42.91	2.4796	19 33 20.4	1.814	8	7 46 55.19	2.2274	15 59 54.7	6.691
9	5 56 11.56	2.4753	19 31 27.8	1.939	9	7 49 8.67	2.2219	15 53 10.9	6.768
10	5 58 39.95	2.4709	19 29 27.7	2.062	10	7 51 21.82	2.2163	15 46 22.5	6.843
11	6 1 8.07	2.4664	19 27 20.3	2.184	11	7 53 34.63	2.2107	15 39 29.7	6.916
12	6 3 35.92	2.4619	19 25 5.6	2.306	12	7 55 47.11	2.2052	15 32 32.6	6.989
13	6 6 3.50	2.4573	19 22 43.6	2.427	13	7 57 59.26	2.1998	15 25 31.1	7.062
14	6 8 30.80	2.4527	19 20 14.4	2.547	14	8 0 11.09	2.1944	15 18 25.2	7.133
15	6 10 57.82	2.4479	19 17 38.0	2.666	15	8 2 22.59	2.1889	15 11 15.1	7.203
16	6 13 24.55	2.4432	19 14 54.5	2.783	16	8 4 33.76	2.1835	15 4 0.8	7.272
17	6 15 51.00	2.4384	19 12 4.0	2.900	17	8 6 44.61	2.1782	14 56 42.4	7.340
18	6 18 17.16	2.4335	19 9 6.5	3.017	18	8 8 55.14	2.1728	14 49 20.0	7.407
19	6 20 43.02	2.4286	19 6 2.0	3.132	19	8 11 5.34	2.1674	14 41 53.6	7.473
20	6 23 8.59	2.4237	19 2 50.6	3.247	20	8 13 15.23	2.1621	14 34 23.2	7.539
21	6 25 33.86	2.4187	18 59 32.4	3.360	21	8 15 24.80	2.1568	14 26 48.9	7.603
22	6 27 58.83	2.4136	18 56 7.4	3.473	22	8 17 34.05	2.1516	14 19 10.8	7.666
23	6 30 23.49	2.4084	N.18 52 35.6	3.585	23	8 19 42.99	2.1464	N.14 11 29.0	7.728
	THURSDAY 10.					SATURDAY 12.			
0	6 32 47.84	2.4032	N.18 48 57.2	3.695	0	8 21 51.62	2.1412	N.14 3 43.4	7.790
1	6 35 11.88	2.3981	18 45 12.2	3.804	1	8 23 59.94	2.1361	13 55 54.2	7.849
2	6 37 35.61	2.3929	18 41 20.7	3.913	2	8 26 7.95	2.1309	13 48 1.5	7.908
3	6 39 59.03	2.3876	18 37 22.6	4.021	3	8 28 15.65	2.1258	13 40 5.2	7.967
4	6 42 22.13	2.3823	18 33 18.1	4.127	4	8 30 23.05	2.1208	13 32 5.4	8.025
5	6 44 44.91	2.3771	18 29 7.3	4.233	5	8 32 30.15	2.1157	13 24 2.2	8.081
6	6 47 7.38	2.3717	18 24 50.1	4.338	6	8 34 36.94	2.1107	13 15 55.7	8.136
7	6 49 29.52	2.3663	18 20 26.7	4.442	7	8 36 43.44	2.1058	13 7 45.9	8.191
8	6 51 51.34	2.3609	18 15 57.1	4.544	8	8 38 49.64	2.1009	12 59 32.8	8.245
9	6 54 12.83	2.3554	18 11 21.4	4.646	9	8 40 55.55	2.0960	12 51 16.5	8.297
10	6 56 33.99	2.3499	18 6 39.6	4.747	10	8 43 1.16	2.0912	12 42 57.1	8.349
11	6 58 54.82	2.3445	18 1 51.8	4.846	11	8 45 6.49	2.0864	12 34 34.6	8.401
12	7 1 15.33	2.3390	17 56 58.1	4.944	12	8 47 11.53	2.0817	12 26 9.0	8.451
13	7 3 35.50	2.3334	17 51 58.5	5.042	13	8 49 16.29	2.0770	12 17 40.5	8.499
14	7 5 55.34	2.3279	17 46 53.1	5.138	14	8 51 20.77	2.0722	12 9 9.1	8.547
15	7 8 14.85	2.3224	17 41 42.0	5.233	15	8 53 24.96	2.0676	12 0 34.8	8.595
16	7 10 34.03	2.3168	17 36 25.2	5.328	16	8 55 28.88	2.0631	11 51 57.7	8.642
17	7 12 52.87	2.3112	17 31 2.7	5.421	17	8 57 32.53	2.0586	11 43 17.8	8.688
18	7 15 11.38	2.3057	17 25 34.7	5.512	18	8 59 35.91	2.0541	11 34 35.2	8.733
19	7 17 29.55	2.3001	17 20 1.2	5.603	19	9 1 39.02	2.0496	11 25 49.9	8.776
20	7 19 47.39	2.2945	17 14 22.3	5.693	20	9 3 41.86	2.0452	11 17 2.1	8.818
21	7 22 4.89	2.2888	17 8 38.0	5.783	21	9 5 44.44	2.0408	11 8 11.7	8.861
22	7 24 22.05	2.2832	17 2 48.4	5.871	22	9 7 46.76	2.0365	10 59 18.8	8.903
23	7 26 38.88	2.2777	16 56 53.5	5.957	23	9 9 48.82	2.0322	10 50 23.4	8.943
24	7 28 55.37	2.2720	N.16 50 53.5	6.042	24	9 11 50.62	2.0279	N.10 41 25.6	8.983

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 13.					**TUESDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 11 50.62	2.0279	N.10 41 25.6	8.983	0	10 45 18.36	1.8868	N. 2 58 37.7	10.038
1	9 13 52.17	2.0238	10 32 25.4	9.022	1	10 47 11.52	1.8852	2 48 35.2	10.044
2	9 15 53.48	2.0197	10 23 23.0	9.059	2	10 49 4.59	1.8837	2 38 32.4	10.049
3	9 17 54.54	2.0157	10 14 18.3	9.096	3	10 50 57.56	1.8822	2 28 29.3	10.054
4	9 19 55.36	2.0117	10 5 11.4	9.133	4	10 52 50.45	1.8807	2 18 25.9	10.059
5	9 21 55.94	2.0077	9 56 2.3	9.170	5	10 54 43.25	1.8793	2 8 22.2	10.063
6	9 23 56.28	2.0037	9 46 51.0	9.205	6	10 56 35.97	1.8780	1 58 18.3	10.067
7	9 25 56.38	1.9998	9 37 37.7	9.239	7	10 58 28.61	1.8767	1 48 14.2	10.069
8	9 27 56.26	1.9961	9 28 22.4	9.273	8	11 0 21.18	1.8755	1 38 10.0	10.071
9	9 29 55.91	1.9923	9 19 5.0	9.306	9	11 2 13.67	1.8743	1 28 5.7	10.072
10	9 31 55.34	1.9886	9 9 45.7	9.337	10	11 4 6.09	1.8732	1 18 1.3	10.073
11	9 33 54.54	1.9849	9 0 24.6	9.368	11	11 5 58.45	1.8721	1 7 56.9	10.074
12	9 35 53.52	1.9812	8 51 1.6	9.398	12	11 7 50.74	1.8710	0 57 52.4	10.074
13	9 37 52.29	1.9777	8 41 36.8	9.428	13	11 9 42.97	1.8701	0 47 48.0	10.073
14	9 39 50.85	1.9742	8 32 10.3	9.457	14	11 11 35.15	1.8692	0 37 43.7	10.072
15	9 41 49.20	1.9707	8 22 42.0	9.485	15	11 13 27.28	1.8684	0 27 39.4	10.070
16	9 43 47.34	1.9672	8 13 12.1	9.513	16	11 15 19.36	1.8676	0 17 35.3	10.068
17	9 45 45.27	1.9638	8 3 40.5	9.540	17	11 17 11.39	1.8668	N. 0 7 31.3	10.065
18	9 47 43.00	1.9606	7 54 7.3	9.566	18	11 19 3.37	1.8660	S. 0 2 32.5	10.061
19	9 49 40.54	1.9574	7 44 32.6	9.591	19	11 20 55.31	1.8654	0 12 36.0	10.057
20	9 51 37.89	1.9542	7 34 56.4	9.615	20	11 22 47.22	1.8648	0 22 39.3	10.052
21	9 53 35.05	1.9511	7 25 18.8	9.639	21	11 24 39.09	1.8642	0 32 42.3	10.047
22	9 55 32.02	1.9480	7 15 39.7	9.662	22	11 26 30.93	1.8638	0 42 45.0	10.042
23	9 57 28.81	1.9449	N. 7 5 59.3	9.685	23	11 28 22.75	1.8634	S. 0 52 47.3	10.035
	MONDAY 14.					**WEDNESDAY 16.**			
0	9 59 25.41	1.9419	N. 6 56 17.5	9.707	0	11 30 14.54	1.8630	S. 1 2 49.2	10.028
1	10 1 21.84	1.9391	6 46 34.4	9.728	1	11 32 6.31	1.8627	1 12 50.7	10.021
2	10 3 18.10	1.9362	6 36 50.1	9.748	2	11 33 58.06	1.8623	1 22 51.7	10.013
3	10 5 14.18	1.9334	6 27 4.6	9.768	3	11 35 49.79	1.8621	1 32 52.2	10.004
4	10 7 10.10	1.9306	6 17 17.9	9.787	4	11 37 41.51	1.8619	1 42 52.2	9.995
5	10 9 5.85	1.9278	6 7 30.1	9.806	5	11 39 33.22	1.8618	1 52 51.6	9.986
6	10 11 1.44	1.9252	5 57 41.2	9.824	6	11 41 24.92	1.8617	2 2 50.5	9.977
7	10 12 56.87	1.9226	5 47 51.2	9.842	7	11 43 16.62	1.8617	2 12 48.8	9.966
8	10 14 52.15	1.9201	5 38 0.2	9.858	8	11 45 8.32	1.8617	2 22 46.4	9.953
9	10 16 47.28	1.9176	5 28 8.3	9.873	9	11 47 0.02	1.8618	2 32 43.2	9.941
10	10 18 42.26	1.9152	5 18 15.5	9.888	10	11 48 51.73	1.8619	2 42 39.3	9.929
11	10 20 37.10	1.9128	5 8 21.7	9.904	11	11 50 43.45	1.8620	2 52 34.7	9.917
12	10 22 31.80	1.9105	4 58 27.0	9.918	12	11 52 35.17	1.8622	3 2 29.3	9.903
13	10 24 26.36	1.9082	4 48 31.5	9.931	13	11 54 26.91	1.8625	3 12 23.1	9.889
14	10 26 20.79	1.9060	4 38 35.3	9.943	14	11 56 18.67	1.8628	3 22 16.0	9.874
15	10 28 15.08	1.9038	4 28 38.3	9.956	15	11 58 10.45	1.8632	3 32 8.0	9.859
16	10 30 9.24	1.9017	4 18 40.6	9.968	16	12 0 2.25	1.8636	3 41 59.1	9.844
17	10 32 3.28	1.8997	4 8 42.2	9.978	17	12 1 54.08	1.8640	3 51 49.3	9.828
18	10 33 57.20	1.8977	3 58 43.2	9.988	18	12 3 45.93	1.8645	4 1 38.5	9.811
19	10 35 51.00	1.8958	3 48 43.6	9.998	19	12 5 37.82	1.8651	4 11 26.6	9.793
20	10 37 44.69	1.8939	3 38 43.4	10.007	20	12 7 29.74	1.8657	4 21 13.7	9.776
21	10 39 38.27	1.8921	3 28 42.7	10.016	21	12 9 21.70	1.8663	4 30 59.7	9.757
22	10 41 31.74	1.8903	3 18 41.5	10.024	22	12 11 13.70	1.8670	4 40 44.6	9.738
23	10 43 25.10	1.8885	3 8 39.8	10.032	23	12 13 5.74	1.8678	4 50 28.3	9.718
24	10 45 18.36	1.8868	N. 2 58 37.7	10.038	24	12 14 57.83	1.8686	S. 5 0 10.8	9.698

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 17.					**SATURDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 14 57.83	1.8686	S. 5 0 10.8	9.698	0	13 46 21.20	1.9537	S. 12 11 37.9	8.049
1	12 16 49.97	1.8694	5 9 52.1	9.678	1	13 48 18.50	1.9562	12 19 39.4	8.000
2	12 18 42.16	1.8703	5 19 32.1	9.657	2	13 50 15.95	1.9588	12 27 37.9	7.950
3	12 20 34.40	1.8712	5 29 10.9	9.635	3	13 52 13.55	1.9614	12 35 33.4	7.900
4	12 22 26.70	1.8722	5 38 48.3	9.612	4	13 54 11.31	1.9641	12 43 25.9	7.848
5	12 24 19.06	1.8731	5 48 24.4	9.590	5	13 56 9.24	1.9668	12 51 15.2	7.796
6	12 26 11.47	1.8741	5 57 59.1	9.567	6	13 58 7.33	1.9695	12 59 1.4	7.744
7	12 28 3.95	1.8752	6 7 32.4	9.542	7	14 0 5.58	1.9722	13 6 44.5	7.691
8	12 29 56.50	1.8764	6 17 4.2	9.517	8	14 2 4.00	1.9750	13 14 24.3	7.637
9	12 31 49.12	1.8776	6 26 34.5	9.492	9	14 4 2.58	1.9777	13 22 0.9	7.583
10	12 33 41.81	1.8788	6 36 3.3	9.467	10	14 6 1.33	1.9805	13 29 34.3	7.528
11	12 35 34.58	1.8802	6 45 30.5	9.441	11	14 8 0.24	1.9833	13 37 4.3	7.472
12	12 37 27.43	1.8815	6 54 56.2	9.414	12	14 9 59.32	1.9861	13 44 30.9	7.415
13	12 39 20.36	1.8828	7 4 20.2	9.386	13	14 11 58.57	1.9890	13 51 54.1	7.358
14	12 41 13.37	1.8842	7 13 42.5	9.357	14	14 13 58.00	1.9919	13 59 13.9	7.301
15	12 43 6.46	1.8856	7 23 3.1	9.329	15	14 15 57.60	1.9947	14 6 30.2	7.242
16	12 44 59.64	1.8871	7 32 22.0	9.301	16	14 17 57.37	1.9976	14 13 43.0	7.183
17	12 46 52.91	1.8886	7 41 39.2	9.272	17	14 19 57.31	2.0005	14 20 52.2	7.123
18	12 48 46.27	1.8902	7 50 54.6	9.241	18	14 21 57.43	2.0034	14 27 57.8	7.063
19	12 50 39.73	1.8918	8 0 8.1	9.209	19	14 23 57.72	2.0063	14 34 59.8	7.003
20	12 52 33.29	1.8934	8 9 19.7	9.177	20	14 25 58.19	2.0093	14 41 58.2	6.942
21	12 54 26.94	1.8951	8 18 29.4	9.145	21	14 27 58.84	2.0123	14 48 52.9	6.880
22	12 56 20.70	1.8968	8 27 37.1	9.113	22	14 29 59.67	2.0152	14 55 43.8	6.817
23	12 58 14.56	1.8986	S. 8 36 42.9	9.080	23	14 32 0.67	2.0182	S. 15 2 30.9	6.753
	FRIDAY 18.					**SUNDAY 20.**			
0	13 0 8.53	1.9004	S. 8 45 46.7	9.046	0	14 34 1.85	2.0212	S. 15 9 14.1	6.688
1	13 2 2.61	1.9022	8 54 48.4	9.011	1	14 36 3.22	2.0242	15 15 53.5	6.624
2	13 3 56.80	1.9041	9 3 48.0	8.977	2	14 38 4.76	2.0272	15 22 29.0	6.558
3	13 5 51.10	1.9060	9 12 45.6	8.941	3	14 40 6.48	2.0302	15 29 0.5	6.492
4	13 7 45.52	1.9080	9 21 41.0	8.904	4	14 42 8.38	2.0332	15 35 28.0	6.425
5	13 9 40.06	1.9099	9 30 34.1	8.867	5	14 44 10.47	2.0363	15 41 51.5	6.358
6	13 11 34.71	1.9119	9 39 25.0	8.830	6	14 46 12.74	2.0393	15 48 11.0	6.291
7	13 13 29.49	1.9140	9 48 13.7	8.792	7	14 48 15.19	2.0423	15 54 26.4	6.222
8	13 15 24.39	1.9160	9 57 0.0	8.753	8	14 50 17.82	2.0453	16 0 37.6	6.152
9	13 17 19.41	1.9181	10 5 44.0	8.713	9	14 52 20.63	2.0484	16 6 44.6	6.082
10	13 19 14.56	1.9202	10 14 25.6	8.673	10	14 54 23.63	2.0515	16 12 47.4	6.011
11	13 21 9.84	1.9225	10 23 4.8	8.633	11	14 56 26.81	2.0545	16 18 45.9	5.940
12	13 23 5.26	1.9247	10 31 41.6	8.592	12	14 58 30.17	2.0575	16 24 40.2	5.869
13	13 25 0.81	1.9270	10 40 15.9	8.550	13	15 0 33.71	2.0606	16 30 30.2	5.796
14	13 26 56.50	1.9292	10 48 47.6	8.508	14	15 2 37.44	2.0637	16 36 15.8	5.722
15	13 28 52.32	1.9315	10 57 16.8	8.465	15	15 4 41.35	2.0667	16 41 56.9	5.648
16	13 30 48.28	1.9338	11 5 43.4	8.421	16	15 6 45.44	2.0697	16 47 33.6	5.574
17	13 32 44.38	1.9362	11 14 7.3	8.377	17	15 8 49.71	2.0727	16 53 5.8	5.500
18	13 34 40.63	1.9387	11 22 28.6	8.332	18	15 10 54.17	2.0758	16 58 33.6	5.425
19	13 36 37.02	1.9411	11 30 47.2	8.287	19	15 12 58.81	2.0788	17 3 56.8	5.348
20	13 38 33.56	1.9435	11 39 3.0	8.240	20	15 15 3.63	2.0818	17 9 15.4	5.271
21	13 40 30.24	1.9459	11 47 16.0	8.193	21	15 17 8.63	2.0848	17 14 29.3	5.193
22	13 42 27.07	1.9485	11 55 26.2	8.146	22	15 19 13.81	2.0878	17 19 38.6	5.116
23	13 44 24.06	1.9511	12 3 33.5	8.098	23	15 21 19.17	2.0907	17 24 43.2	5.038
24	13 46 21.20	1.9537	S. 12 11 37.9	8.049	24	15 23 24.70	2.0937	S. 17 29 43.1	4.958

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 21.					WEDNESDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 23 24.70	2.0937	S. 17 29 43.1	4.958	0	17 6 58.06	2.2098	S. 19 46 7.6	0.551
1	15 25 30.41	2.0967	17 34 38.2	4.878	1	17 9 10.70	2.2114	19 46 37.6	0.449
2	15 27 36.30	2.0997	17 39 28.5	4.797	2	17 11 23.43	2.2130	19 47 1.5	0.348
3	15 29 42.38	2.1027	17 44 13.9	4.716	3	17 13 36.26	2.2146	19 47 19.3	0.246
4	15 31 48.63	2.1056	17 48 54.4	4.634	4	17 15 49.18	2.2160	19 47 31.0	0.143
5	15 33 55.05	2.1085	17 53 30.0	4.552	5	17 18 2.18	2.2173	19 47 36.5	− 0.041
6	15 36 1.65	2.1114	17 58 0.7	4.470	6	17 20 15.26	2.2187	19 47 35.9	+ 0.061
7	15 38 8.42	2.1143	18 2 26.4	4.386	7	17 22 28.42	2.2200	19 47 29.2	0.164
8	15 40 15.36	2.1172	18 6 47.0	4.302	8	17 24 41.66	2.2213	19 47 16.3	0.267
9	15 42 22.48	2.1201	18 11 2.6	4.217	9	17 26 54.98	2.2226	19 46 57.2	0.370
10	15 44 29.77	2.1229	18 15 13.1	4.132	10	17 29 8.37	2.2238	19 46 31.9	0.473
11	15 46 37.23	2.1257	18 19 18.5	4.047	11	17 31 21.83	2.2249	19 46 0.4	0.576
12	15 48 44.85	2.1284	18 23 18.8	3.961	12	17 33 35.36	2.2260	19 45 22.8	0.678
13	15 50 52.64	2.1312	18 27 13.9	3.874	13	17 35 48.95	2.2270	19 44 39.0	0.782
14	15 53 0.60	2.1340	18 31 3.7	3.787	14	17 38 2.60	2.2281	19 43 48.9	0.886
15	15 55 8.72	2.1367	18 34 48.3	3.699	15	17 40 16.32	2.2291	19 42 52.6	0.990
16	15 57 17.01	2.1395	18 38 27.6	3.611	16	17 42 30.09	2.2300	19 41 50.1	1.093
17	15 59 25.46	2.1422	18 42 1.6	3.522	17	17 44 43.92	2.2309	19 40 41.4	1.197
18	16 1 34.07	2.1448	18 45 30.3	3.433	18	17 46 57.80	2.2317	19 39 26.4	1.302
19	16 3 42.84	2.1475	18 48 53.6	3.343	19	17 49 11.73	2.2325	19 38 5.2	1.406
20	16 5 51.77	2.1501	18 52 11.4	3.252	20	17 51 25.70	2.2332	19 36 37.7	1.510
21	16 8 0.85	2.1526	18 55 23.8	3.162	21	17 53 39.72	2.2340	19 35 4.0	1.613
22	16 10 10.08	2.1552	18 58 30.8	3.071	22	17 55 53.78	2.2347	19 33 24.1	1.717
23	16 12 19.47	2.1577	S. 19 1 32.3	2.978	23	17 58 7.88	2.2353	S. 19 31 37.9	1.822
	TUESDAY 22.					THURSDAY 24.			
0	16 14 29.01	2.1602	S. 19 4 28.2	2.886	0	18 0 22.01	2.2358	S. 19 29 45.5	1.926
1	16 16 38.70	2.1627	19 7 18.6	2.793	1	18 2 36.18	2.2364	19 27 46.8	2.030
2	16 18 48.53	2.1651	19 10 3.4	2.700	2	18 4 50.38	2.2368	19 25 41.9	2.133
3	16 20 58.51	2.1675	19 12 42.6	2.607	3	18 7 4.60	2.2373	19 23 30.8	2.237
4	16 23 8.63	2.1699	19 15 16.2	2.513	4	18 9 18.85	2.2377	19 21 13.4	2.341
5	16 25 18.90	2.1723	19 17 44.1	2.418	5	18 11 33.12	2.2381	19 18 49.8	2.445
6	16 27 29.31	2.1746	19 20 6.3	2.323	6	18 13 47.42	2.2384	19 16 20.0	2.548
7	16 29 39.85	2.1769	19 22 22.8	2.228	7	18 16 1.73	2.2387	19 13 44.0	2.652
8	16 31 50.53	2.1792	19 24 33.6	2.132	8	18 18 16.06	2.2390	19 11 1.7	2.756
9	16 34 1.35	2.1814	19 26 38.6	2.035	9	18 20 30.41	2.2392	19 8 13.2	2.860
10	16 36 12.30	2.1835	19 28 37.8	1.938	10	18 22 44.77	2.2393	19 5 18.5	2.963
11	16 38 23.37	2.1855	19 30 31.2	1.842	11	18 24 59.13	2.2394	19 2 17.6	3.067
12	16 40 34.57	2.1876	19 32 18.8	1.744	12	18 27 13.50	2.2395	18 59 10.5	3.170
13	16 42 45.89	2.1897	19 34 0.5	1.647	13	18 29 27.87	2.2396	18 55 57.2	3.272
14	16 44 57.34	2.1918	19 35 36.4	1.549	14	18 31 42.25	2.2397	18 52 37.8	3.375
15	16 47 8.91	2.1938	19 37 6.4	1.450	15	18 33 56.63	2.2396	18 49 12.2	3.477
16	16 49 20.60	2.1957	19 38 30.4	1.351	16	18 36 11.00	2.2395	18 45 40.5	3.579
17	16 51 32.40	2.1977	19 39 48.5	1.252	17	18 38 25.37	2.2394	18 42 2.7	3.682
18	16 53 44.32	2.1996	19 41 0.7	1.153	18	18 40 39.73	2.2392	18 38 18.7	3.784
19	16 55 56.35	2.2013	19 42 6.9	1.053	19	18 42 54.08	2.2391	18 34 28.6	3.886
20	16 58 8.48	2.2031	19 43 7.1	0.953	20	18 45 8.43	2.2389	18 30 32.4	3.987
21	17 0 20.72	2.2049	19 44 1.3	0.852	21	18 47 22.75	2.2387	18 26 30.2	4.087
22	17 2 33.07	2.2067	19 44 49.4	0.752	22	18 49 37.06	2.2384	18 22 21.9	4.188
23	17 4 45.52	2.2083	19 45 31.5	0.652	23	18 51 51.35	2.2381	18 18 7.6	4.289
24	17 6 58.06	2.2098	S. 19 46 7.6	0.551	24	18 54 5.63	2.2378	S. 18 13 47.2	4.390

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 25.					SUNDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 54 5.63	2.2378	S. 18 13 47.2	4.390	0	20 40 43.00	2.2009	S. 12 55 5.1	8.692
1	18 56 19.89	2.2374	18 9 20.8	4.490	1	20 42 55.03	2.2001	12 46 21.3	8.767
2	18 58 34.12	2.2369	18 4 48.4	4.590	2	20 45 7.01	2.1993	12 37 33.0	8.842
3	19 0 48.32	2.2365	18 0 10.0	4.689	3	20 47 18.94	2.1985	12 28 40.2	8.916
4	19 3 2.50	2.2361	17 55 25.7	4.788	4	20 49 30.83	2.1977	12 19 43.0	8.989
5	19 5 16.65	2.2357	17 50 35.4	4.887	5	20 51 42.67	2.1969	12 10 41.5	9.062
6	19 7 30.78	2.2352	17 45 39.2	4.986	6	20 53 54.46	2.1962	12 1 35.6	9.134
7	19 9 44.87	2.2346	17 40 37.1	5.084	7	20 56 6.21	2.1954	11 52 25.4	9.205
8	19 11 58.93	2.2340	17 35 29.1	5.182	8	20 58 17.91	2.1947	11 43 11.0	9.275
9	19 14 12.95	2.2334	17 30 15.3	5.279	9	21 0 29.57	2.1940	11 33 52.4	9.344
10	19 16 26.94	2.2328	17 24 55.6	5.376	10	21 2 41.19	2.1933	11 24 29.7	9.413
11	19 18 40.89	2.2322	17 19 30.2	5.472	11	21 4 52.77	2.1926	11 15 2.8	9.482
12	19 20 54.81	2.2316	17 13 59.0	5.568	12	21 7 4.30	2.1919	11 5 31.8	9.550
13	19 23 8.69	2.2309	17 8 22.0	5.664	13	21 9 15.80	2.1913	10 55 56.8	9.616
14	19 25 22.52	2.2302	17 2 39.3	5.760	14	21 11 27.26	2.1907	10 46 17.9	9.682
15	19 27 36.31	2.2295	16 56 50.8	5.856	15	21 13 38.69	2.1902	10 36 35.0	9.747
16	19 29 50.06	2.2287	16 50 56.6	5.950	16	21 15 50.09	2.1897	10 26 48.2	9.811
17	19 32 3.76	2.2279	16 44 56.8	6.043	17	21 18 1.46	2.1892	10 16 57.6	9.874
18	19 34 17.41	2.2272	16 38 51.4	6.137	18	21 20 12.79	2.1886	10 7 3.3	9.937
19	19 36 31.02	2.2264	16 32 40.4	6.230	19	21 22 24.09	2.1882	9 57 5.2	9.999
20	19 38 44.58	2.2256	16 26 23.8	6.323	20	21 24 35.37	2.1877	9 47 3.4	10.060
21	19 40 58.09	2.2247	16 20 1.6	6.416	21	21 26 46.62	2.1873	9 36 58.0	10.120
22	19 43 11.55	2.2239	16 13 33.9	6.507	22	21 28 57.85	2.1870	9 26 49.0	10.179
23	19 45 24.96	2.2232	S. 16 7 0.7	6.598	23	21 31 9.06	2.1866	S. 9 16 36.5	10.237
	SATURDAY 26.					MONDAY 28.			
0	19 47 38.33	2.2224	S. 16 0 22.1	6.689	0	21 33 20.24	2.1863	S. 9 6 20.5	10.295
1	19 49 51.65	2.2215	15 53 38.0	6.780	1	21 35 31.41	2.1860	8 56 1.1	10.352
2	19 52 4.91	2.2205	15 46 48.5	6.869	2	21 37 42.56	2.1858	8 45 38.3	10.408
3	19 54 18.11	2.2196	15 39 53.7	6.958	3	21 39 53.70	2.1856	8 35 12.1	10.464
4	19 56 31.26	2.2187	15 32 53.5	7.047	4	21 42 4.83	2.1853	8 24 42.6	10.518
5	19 58 44.36	2.2179	15 25 48.1	7.134	5	21 44 15.94	2.1851	8 14 9.9	10.571
6	20 0 57.41	2.2170	15 18 37.4	7.222	6	21 46 27.04	2.1850	8 3 34.1	10.623
7	20 3 10.40	2.2161	15 11 21.4	7.309	7	21 48 38.14	2.1849	7 52 55.1	10.676
8	20 5 23.34	2.2152	15 4 0.3	7.395	8	21 50 49.23	2.1848	7 42 13.0	10.727
9	20 7 36.23	2.2143	14 56 34.0	7.481	9	21 53 0.32	2.1848	7 31 27.9	10.777
10	20 9 49.06	2.2134	14 49 2.6	7.566	10	21 55 11.41	2.1848	7 20 39.8	10.825
11	20 12 1.84	2.2125	14 41 26.1	7.651	11	21 57 22.50	2.1849	7 9 48.9	10.872
12	20 14 14.56	2.2116	14 33 44.5	7.735	12	21 59 33.60	2.1850	6 58 55.1	10.920
13	20 16 27.23	2.2107	14 25 57.9	7.818	13	22 1 44.70	2.1851	6 47 58.5	10.967
14	20 18 39.84	2.2097	14 18 6.3	7.901	14	22 3 55.81	2.1853	6 36 59.1	11.012
15	20 20 52.40	2.2088	14 10 9.8	7.983	15	22 6 6.94	2.1856	6 25 57.0	11.057
16	20 23 4.90	2.2079	14 2 8.4	8.064	16	22 8 18.08	2.1858	6 14 52.3	11.100
17	20 25 17.35	2.2070	13 54 2.1	8.145	17	22 10 29.24	2.1861	6 3 45.0	11.142
18	20 27 29.74	2.2061	13 45 51.0	8.225	18	22 12 40.41	2.1864	5 52 35.2	11.184
19	20 29 42.08	2.2052	13 37 35.1	8.304	19	22 14 51.61	2.1868	5 41 22.9	11.225
20	20 31 54.37	2.2044	13 29 14.5	8.383	20	22 17 2.82	2.1872	5 30 8.2	11.265
21	20 34 6.61	2.2035	13 20 49.1	8.462	21	22 19 14.07	2.1877	5 18 51.1	11.304
22	20 36 18.79	2.2026	13 12 19.0	8.540	22	22 21 25.35	2.1882	5 7 31.7	11.342
23	20 38 30.92	2.2017	13 3 44.3	8.616	23	22 23 36.66	2.1887	4 56 10.1	11.378
24	20 40 43.00	2.2009	S. 12 55 5.1	8.692	24	22 25 48.00	2.1893	S. 4 44 46.4	11.414

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	22 25 48.00	2.1893	S. 4 44 46.4	11.414
1	22 27 59.38	2.1900	4 33 20.5	11.449
2	22 30 10.80	2.1907	4 21 52.5	11.482
3	22 32 22.26	2.1914	4 10 22.6	11.515
4	22 34 33.77	2.1922	3 58 50.7	11.547
5	22 36 45.32	2.1929	3 47 16.9	11.578
6	22 38 56.92	2.1938	3 35 41.3	11.608
7	22 41 8.58	2.1947	3 24 4.0	11.637
8	22 43 20.29	2.1957	3 12 24.9	11.665
9	22 45 32.06	2.1967	3 0 44.2	11.692
10	22 47 43.89	2.1977	2 49 1.9	11.717
11	22 49 55.79	2.1988	2 37 18.1	11.742
12	22 52 7.75	2.1999	2 25 32.9	11.765
13	22 54 19.78	2.2011	2 13 46.3	11.787
14	22 56 31.89	2.2024	2 1 58.4	11.809
15	22 58 44.07	2.2037	1 50 9.2	11.830
16	23 0 56.33	2.2050	1 38 18.8	11.849
17	23 3 8.67	2.2064	1 26 27.3	11.867
18	23 5 21.10	2.2078	1 14 34.7	11.885
19	23 7 33.61	2.2092	1 2 41.1	11.901
20	23 9 46.21	2.2108	0 50 46.6	11.915
21	23 11 58.91	2.2125	0 38 51.3	11.928
22	23 14 11.71	2.2141	0 26 55.2	11.942
23	23 16 24.60	2.2157	S. 0 14 58.3	11.954

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	23 18 37.59	2.2174	S. 0 3 0.7	11.965
1	23 20 50.69	2.2192	N. 0 8 57.5	11.974
2	23 23 3.90	2.2210	0 20 56.2	11.981
3	23 25 17.21	2.2228	0 32 55.2	11.987
4	23 27 30.63	2.2248	0 44 54.6	11.993
5	23 29 44.18	2.2268	0 56 54.4	11.998
6	23 31 57.85	2.2288	1 8 54.4	12.002
7	23 34 11.64	2.2308	1 20 54.6	12.004
8	23 36 25.55	2.2329	1 32 54.9	12.005
9	23 38 39.59	2.2351	1 44 55.2	12.005
10	23 40 53.76	2.2373	1 56 55.5	12.004
11	23 43 8.07	2.2396	2 8 55.7	12.001
12	23 45 22.51	2.2418	2 20 55.6	11.997
13	23 47 37.09	2.2442	2 32 55.3	11.992
14	23 49 51.81	2.2466	2 44 54.7	11.986
15	23 52 6.68	2.2490	2 56 53.6	11.978
16	23 54 21.69	2.2515	3 8 52.0	11.969
17	23 56 36.86	2.2541	3 20 49.9	11.959
18	23 58 52.18	2.2566	3 32 47.1	11.947
19	0 1 7.65	2.2592	3 44 43.6	11.935
20	0 3 23.28	2.2619	3 56 39.3	11.922
21	0 5 39.08	2.2647	4 8 34.2	11.907
22	0 7 55.04	2.2674	4 20 28.2	11.891
23	0 10 11.17	2.2702	4 32 21.1	11.872
24	0 12 27.46	2.2729	N. 4 44 12.9	11.853

THURSDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	0 12 27.46	2.2729	N. 4 44 12.9	11.853
1	0 14 43.92	2.2758	4 56 3.5	11.833
2	0 17 0.56	2.2788	5 7 52.9	11.812
3	0 19 17.38	2.2817	5 19 40.9	11.788
4	0 21 34.37	2.2847	5 31 27.5	11.764
5	0 23 51.54	2.2877	5 43 12.6	11.739
6	0 26 8.90	2.2908	5 54 56.2	11.712
7	0 28 26.44	2.2939	6 6 38.1	11.684
8	0 30 44.17	2.2971	6 18 18.3	11.654
9	0 33 2.09	2.3002	6 29 56.6	11.623
10	0 35 20.20	2.3034	6 41 33.0	11.591
11	0 37 38.50	2.3067	6 53 7.5	11.558
12	0 39 57.00	2.3100	7 4 40.0	11.523
13	0 42 15.70	2.3133	7 16 10.3	11.487
14	0 44 34.60	2.3167	7 27 38.4	11.448
15	0 46 53.70	2.3201	7 39 4.1	11.408
16	0 49 13.01	2.3235	7 50 27.4	11.368
17	0 51 32.52	2.3269	8 1 48.3	11.327
18	0 53 52.24	2.3304	8 13 6.7	11.284
19	0 56 12.17	2.3339	8 24 22.4	11.239
20	0 58 32.31	2.3374	8 35 35.4	11.193
21	1 0 52.66	2.3409	8 46 45.6	11.145
22	1 3 13.22	2.3445	8 57 52.8	11.096
23	1 5 34.00	2.3482	N. 9 8 57.1	11.047

FRIDAY, JUNE 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	1 7 55.00	2.3518	N. 9 19 58.4	10.995

PHASES OF THE MOON.

	d	h	m
● New Moon	6	9	58.2
☽ First Quarter . . .	13	10	54.1
○ Full Moon	21	15	11.5
☾ Last Quarter. . . .	29	2	22.7

	d	h
☾ Perigee.	5	8.4
☾ Apogee.	17	16.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Antares	W.	78° 32′ 37″	2382	80° 16′ 37″	2367	82° 0′ 59″	2352	83° 45′ 43″	2336
	α Aquilæ	W.	34 30 44	3872	35 44 32	3730	37 0 47	3605	38 19 16	3492
	VENUS	E.	38 36 41	2774	37 1 39	2759	35 26 18	2746	33 50 39	2734
	MARS	E.	42 27 14	2617	40 48 42	2602	39 9 50	2587	37 30 38	2574
	SUN	E.	74 37 31	2660	72 59 58	2644	71 22 3	2628	69 43 46	2612
2	Antares	W.	92 34 55	2263	94 21 49	2249	96 9 3	2235	97 56 38	2222
	α Aquilæ	W.	45 19 35	3074	46 48 16	3011	48 18 15	2954	49 49 26	2901
	SUN	E.	61 26 53	2533	59 46 26	2518	58 5 38	2504	56 24 30	2489
3	Antares	W.	106 59 16	2163	108 48 40	2152	110 38 20	2142	112 28 15	2132
	α Aquilæ	W.	57 40 33	2693	59 17 22	2661	60 54 54	2631	62 33 7	2602
	SUN	E.	47 53 52	2422	46 10 49	2410	44 27 28	2398	42 43 50	2387
4	Antares	W.	121 41 7	2096	123 32 13	2090	125 23 27	2086	127 14 48	2083
	α Aquilæ	W.	70 52 48	2494	72 34 9	2479	74 15 52	2465	75 57 55	2451
	SUN	E.	34 2 0	2340	32 16 59	2333	30 31 47	2326	28 46 25	2319
8	SUN	W.	22 2 30	2464	23 44 34	2479	25 26 17	2494	27 7 39	2510
	Pollux	E.	43 5 19	2371	41 21 3	2401	39 37 30	2434	37 54 43	2469
	Regulus	E.	78 48 44	2187	76 59 57	2201	75 11 31	2216	73 23 28	2232
9	SUN	W.	35 28 39	2597	37 7 38	2616	38 46 11	2635	40 24 19	2653
	Regulus	E.	64 29 12	2317	62 43 37	2335	60 58 28	2353	59 13 45	2371
	Spica	E.	118 11 6	2291	116 24 54	2309	114 39 7	2326	112 53 46	2344
10	SUN	W.	48 28 31	2751	50 4 3	2771	51 39 9	2791	53 13 48	2811
	Regulus	E.	50 37 4	2470	48 55 8	2490	47 13 41	2511	45 32 43	2532
	Spica	E.	104 13 28	2435	102 30 43	2454	100 48 25	2472	99 6 33	2490
11	SUN	W.	61 0 36	2911	62 32 41	2930	64 4 22	2950	65 35 38	2969
	JUPITER	W.	20 39 11	2729	22 15 12	2738	23 51 2	2747	25 26 39	2758
	Regulus	E.	37 15 12	2641	35 37 12	2663	33 59 43	2687	32 22 46	2711
	Spica	E.	90 43 38	2583	89 4 20	2601	87 25 26	2619	85 46 57	2637
12	SUN	W.	73 6 3	3062	74 34 59	3079	76 3 34	3097	77 31 47	3114
	JUPITER	W.	33 20 44	2824	34 54 40	2839	36 28 17	2853	38 1 36	2868
	Spica	E.	77 40 28	2722	76 4 18	2739	74 28 30	2756	72 53 4	2772
13	SUN	W.	84 47 52	3194	86 14 8	3209	87 40 7	3224	89 5 48	3237
	JUPITER	W.	45 43 41	2935	47 15 15	2949	48 46 32	2961	50 17 33	2974
	Pollux	W.	28 7 59	3264	29 32 53	3240	30 58 15	3220	32 24 0	3204
	Spica	E.	65 0 54	2845	63 27 25	2859	61 54 13	2873	60 21 19	2885
	Antares	E.	110 24 21	2881	108 51 38	2894	107 19 12	2907	105 47 2	2919
14	SUN	W.	96 10 18	3301	97 34 29	3313	98 58 26	3324	100 22 10	3333
	JUPITER	W.	57 48 53	3030	59 18 28	3041	60 47 50	3051	62 17 0	3060
	Pollux	W.	39 36 15	3166	41 3 5	3163	42 29 58	3162	43 56 53	3161
	Spica	E.	52 40 45	2943	51 9 21	2954	49 38 11	2964	48 7 13	2974
	Antares	E.	98 9 58	2976	96 39 15	2986	95 8 45	2996	93 38 27	3005
15	SUN	W.	107 18 5	3379	108 40 46	3386	110 3 19	3393	111 25 43	3400
	JUPITER	W.	69 40 7	3101	71 8 15	3108	72 36 15	3114	74 4 8	3119

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Antares W.	85° 30′ 50″	2321	87° 16′ 19″	2306	89° 2′ 10″	2291	90° 48′ 22″	2277
	α Aquilæ W.	39 39 49	3391	41 2 16	3300	42 26 28	3217	43 52 17	3143
	Venus E.	32 14 44	2722	30 38 33	2711	29 2 8	2701	27 25 30	2692
	Mars E.	35 51 7	2560	34 11 17	2547	32 31 9	2535	30 50 44	2522
	Sun E.	68 5 7	2595	66 26 6	2580	64 46 43	2564	63 6 59	2548
2	Antares W.	99 44 32	2209	101 32 46	2197	103 21 18	2185	105 10 8	2173
	α Aquilæ W.	51 21 43	2852	52 55 3	2808	54 29 20	2767	56 4 31	2728
	Sun E.	54 43 1	2475	53 1 12	2461	51 19 4	2448	49 36 37	2435
3	Antares W.	114 18 25	2124	116 8 48	2116	117 59 23	2108	119 50 10	2101
	α Aquilæ W.	64 11 59	2577	65 51 26	2554	67 31 24	2533	69 11 52	2512
	Sun E.	40 59 57	2377	39 15 49	2366	37 31 26	2357	35 46 49	2348
4	Antares W.	129 6 14	2081	130 57 43	2079	132 49 14	2079	134 40 46	2079
	α Aquilæ W.	77 40 17	2440	79 22 55	2431	81 5 46	2422	82 48 49	2416
	Sun E.	27 0 53	2314	25 15 14	2309	23 29 28	2305	21 43 36	2302
8	Sun W.	23 48 39	2527	30 29 15	2544	32 9 27	2561	33 49 15	2579
	Pollux E.	36 12 46	2507	34 31 43	2550	32 51 39	2598	31 12 41	2652
	Regulus E.	71 35 48	2248	69 48 32	2264	68 1 40	2281	66 15 13	2299
9	Sun W.	42 2 2	2672	43 39 19	2692	45 16 9	2712	46 52 33	2731
	Regulus E.	57 29 29	2391	55 45 41	2410	54 2 21	2429	52 19 28	2450
	Spica E.	111 8 50	2362	109 24 20	2380	107 40 16	2398	105 56 39	2417
10	Sun W.	54 48 1	2831	56 21 48	2851	57 55 10	2871	59 28 6	2891
	Regulus E.	43 52 14	2553	42 12 14	2574	40 32 43	2595	38 53 42	2618
	Spica E.	97 25 6	2509	95 44 5	2527	94 3 30	2546	92 23 21	2565
11	Sun W.	67 6 30	2987	68 36 59	3006	70 7 4	3026	71 36 45	3044
	Jupiter W.	27 2 2	2771	28 37 8	2783	30 11 58	2797	31 46 30	2811
	Regulus E.	30 46 21	2736	29 10 29	2763	27 35 12	2791	26 0 32	2821
	Spica E.	84 8 52	2655	82 31 11	2672	80 53 54	2689	79 17 0	2706
12	Sun W.	78 59 40	3131	80 27 12	3147	81 54 25	3163	83 21 18	3179
	Jupiter W.	39 34 36	2882	41 7 18	2895	42 39 43	2909	44 11 50	2922
	Spica E.	71 17 59	2787	69 43 14	2802	68 8 48	2817	66 34 42	2831
13	Sun W.	90 31 13	3251	91 56 22	3264	93 21 15	3277	94 45 54	3289
	Jupiter W	51 48 18	2986	53 18 48	2997	54 49 4	3009	56 19 5	3020
	Pollux W.	33 50 4	3192	35 16 23	3183	36 42 52	3176	38 9 30	3170
	Spica E.	58 48 41	2898	57 16 19	2910	55 44 13	2922	54 12 22	2933
	Antares E.	104 15 7	2931	102 43 28	2943	101 12 4	2954	99 40 54	2965
14	Sun W.	101 45 43	3344	103 9 4	3352	104 32 15	3362	105 55 15	3371
	Jupiter W.	63 45 59	3069	65 14 47	3078	66 43 24	3087	68 11 50	3094
	Pollux W.	45 23 49	3160	46 50 46	3161	48 17 42	3161	49 44 38	3162
	Spica E.	46 36 28	2983	45 5 54	2991	43 35 30	3000	42 5 17	3007
	Antares E.	92 8 21	3014	90 38 26	3023	89 8 42	3032	87 39 9	3039
15	Sun W.	112 48 0	3406	114 10 10	3412	115 32 13	3416	116 54 11	3422
	Jupiter W.	75 31 54	3125	76 59 33	3131	78 27 5	3136	79 54 31	3141

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh	P. L of Diff.	IXh.	P. L. of Diff.
15	Pollux	W.	51° 11′ 33″	3163	52° 38′ 27″	3164	54° 5′ 19″	3165	55° 32′ 10″	3167
	Spica	E.	40 35 13	3015	39 5 19	3022	37 35 33	3029	36 5 56	3035
	Antares	E.	86 9 45	3047	84 40 30	3054	83 11 24	3060	81 42 26	3067
16	Sun	W.	118 16 3	3426	119 37 50	3430	120 59 33	3433	122 21 12	3437
	Jupiter	W.	81 21 51	3144	82 49 7	3148	84 16 19	3151	85 43 27	3154
	Pollux	W.	62 46 4	3172	64 12 47	3172	65 39 29	3172	67 6 11	3173
	Regulus	W.	25 43 46	3161	27 10 42	3155	28 37 45	3150	30 4 54	3146
	Spica	E.	28 39 29	3058	27 10 28	3062	25 41 32	3065	24 12 40	3068
	Antares	E.	74 19 23	3092	72 51 4	3097	71 22 51	3100	69 54 42	3101
17	Sun	W.	129 8 44	3445	130 30 10	3446	131 51 35	3446	133 12 59	3446
	Jupiter	W.	92 58 25	3162	94 25 20	3162	95 52 14	3162	97 19 8	3162
	Pollux	W.	74 19 37	3172	75 46 19	3172	77 13 2	3170	78 39 47	3168
	Regulus	W.	37 21 50	3128	38 49 25	3126	40 17 3	3123	41 44 45	3119
	Antares	E.	62 34 51	3116	61 7 1	3118	59 39 13	3119	58 11 27	3120
	α Aquilæ	E.	112 59 22	3546	111 39 49	3537	110 20 6	3529	109 0 14	3520
18	Jupiter	W.	104 33 47	3157	106 0 48	3155	107 27 51	3153	108 54 56	3150
	Pollux	W.	85 53 59	3160	87 20 56	3157	88 47 56	3155	90 14 59	3152
	Regulus	W.	49 4 11	3104	50 32 16	3100	52 0 25	3096	53 28 39	3092
	Antares	E.	50 52 51	3124	49 25 10	3124	47 57 29	3124	46 29 48	3124
	α Aquilæ	E.	102 18 43	3485	100 58 2	3478	90 37 13	3472	98 16 18	3466
19	Jupiter	W.	116 11 16	3134	117 38 44	3131	119 6 16	3127	120 33 53	3122
	Pollux	W.	97 31 9	3137	98 58 34	3133	100 26 4	3129	101 53 38	3126
	Regulus	W.	60 51 5	3070	62 19 51	3065	63 48 43	3060	65 17 41	3055
	Antares	E.	39 11 31	3127	37 43 54	3128	36 16 19	3131	34 48 47	3134
	α Aquilæ	E.	91 30 10	3441	90 8 40	3438	88 47 6	3433	87 25 27	3430
20	Regulus	W.	72 44 13	3026	74 13 53	3021	75 43 40	3014	77 13 35	3008
	Spica	W.	18 49 44	3005	20 19 50	2999	21 50 4	2993	23 20 25	2988
	α Aquilæ	E.	80 36 16	3416	79 14 17	3415	77 52 17	3413	76 30 15	3412
21	Regulus	W.	84 45 10	2975	86 15 54	2968	87 46 47	2961	89 17 48	2954
	Spica	W.	30 54 6	2955	32 25 15	2948	33 56 33	2942	35 27 59	2935
	α Aquilæ	E.	69 40 7	3417	68 18 10	3421	66 56 17	3425	65 34 29	3430
	Fomalhaut	E.	99 0 35	3430	97 38 53	3420	96 16 59	3411	94 54 55	3401
22	Regulus	W.	96 55 9	2918	98 27 5	2911	99 59 10	2904	101 31 24	2896
	Spica	W.	43 7 26	2898	44 39 48	2890	46 12 19	2883	47 45 0	2876
	α Aquilæ	E.	58 47 14	3471	57 26 18	3484	56 5 36	3498	54 45 10	3515
	Fomalhaut	E.	88 2 7	3364	86 39 9	3357	85 16 3	3351	83 52 51	3346
	α Pegasi	E.	104 59 23	3067	103 30 33	3057	102 1 31	3047	100 32 17	3038
23	Spica	W.	55 30 52	2836	57 4 33	2828	58 38 24	2820	60 12 26	2812
	α Aquilæ	E.	48 8 24	3635	46 50 28	3670	45 33 9	3709	44 16 31	3752
	Fomalhaut	E.	76 55 39	3331	75 32 4	3330	74 8 27	3330	72 44 50	3331
	α Pegasi	E.	93 3 22	2995	91 33 3	2986	90 2 33	2978	88 31 53	2971
24	Spica	W.	68 5 15	2770	69 40 22	2762	71 15 40	2753	72 51 9	2745
	Antares	W.	23 31 2	2965	25 1 58	2935	26 33 33	2906	28 5 42	2884
	Fomalhaut	E.	65 47 18	3349	64 24 3	3356	63 0 56	3364	61 37 58	3373

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
15	Pollux W.	56° 58′ 59″	3168	58° 25′ 47″	3168	59° 52′ 34″	3169	61° 19′ 20″	3171
	Spica E.	34 36 26	3040	33 7 3	3045	31 37 46	3050	30 8 35	3054
	Antares E.	80 13 36	3073	78 44 53	3078	77 16 17	3083	75 47 47	3088
16	Sun W.	123 42 47	3439	125 4 19	3441	126 25 49	3443	127 47 17	3444
	Jupiter W.	87 10 31	3156	88 37 33	3158	90 4 32	3160	91 31 29	3161
	Pollux W.	68 32 52	3173	69 59 33	3173	71 26 14	3173	72 52 55	3172
	Regulus W.	31 32 8	3142	32 59 27	3138	34 26 51	3134	35 54 19	3130
	Spica E.	22 43 51	3069	21 15 4	3072	19 46 20	3074	18 17 39	3076
	Antares E.	68 26 37	3107	66 58 36	3109	65 30 38	3112	64 2 43	3114
17	Sun W.	134 34 23	3446	135 55 48	3445	137 17 14	3444	138 38 41	4442
	Jupiter W.	98 46 2	3162	100 12 56	3162	101 39 51	3160	103 6 48	3158
	Pollux W.	80 6 34	3167	81 33 22	3166	83 0 12	3164	84 27 4	3162
	Regulus W.	43 12 31	3117	44 40 20	3114	46 8 13	3110	47 36 10	3107
	Antares E.	56 43 42	3191	55 15 58	3192	53 48 15	3193	52 20 33	3193
	α Aquilæ E.	107 40 12	3513	106 20 2	3505	104 59 43	3498	103 39 17	3491
18	Jupiter W.	110 22 5	3148	111 49 17	3144	113 16 33	3141	114 43 53	3138
	Pollux W.	91 42 6	3149	93 9 16	3146	94 36 30	3143	96 3 48	3140
	Regulus W.	54 56 58	3088	56 25 22	3084	57 53 51	3080	59 22 25	3075
	Antares E.	45 2 8	3194	43 34 28	3194	42 6 48	3195	40 39 9	3196
	α Aquilæ E.	96 55 16	3461	95 34 8	3455	94 12 54	3451	92 51 35	3446
19	Jupiter W.	122 1 36	3118	123 29 24	3113	124 57 18	3109	126 25 17	3104
	Pollux W.	103 21 16	3122	104 48 59	3119	106 16 46	3114	107 44 38	3110
	Regulus W.	66 46 46	3050	68 15 57	3044	69 45 15	3038	71 14 40	3032
	Antares E.	33 21 19	3138	31 53 55	3142	30 26 36	3148	28 59 24	3156
	α Aquilæ E.	86 3 44	3426	84 41 57	3422	83 20 6	3420	81 58 12	3418
20	Regulus W.	78 43 38	3001	80 13 49	2995	81 44 8	2989	83 14 35	2982
	Spica W.	24 50 53	2981	26 21 29	2975	27 52 13	2969	29 23 5	2961
	α Aquilæ E.	75 8 12	3412	73 46 9	3413	72 24 7	3414	71 2 6	3415
21	Regulus W.	90 48 58	2947	92 20 17	2940	93 51 45	2933	95 23 22	2925
	Spica W.	36 59 34	2927	38 31 18	2920	40 3 11	2912	41 35 14	2905
	α Aquilæ E.	64 12 46	3436	62 51 10	3442	61 29 41	3451	60 8 22	3461
	Fomalhaut E.	93 32 40	3393	92 10 15	3385	90 47 41	3377	89 24 58	3370
22	Regulus W.	103 3 48	2888	104 36 22	2881	106 9 5	2873	107 41 58	2866
	Spica W.	49 17 50	2868	50 50 50	2860	52 24 0	2852	53 57 21	2844
	α Aquilæ E.	53 25 2	3534	52 5 15	3554	50 45 51	3578	49 26 53	3605
	Fomalhaut E.	82 29 33	3342	81 6 10	3338	79 42 43	3335	78 19 12	3333
	α Pegasi E.	99 2 52	3030	97 33 16	3021	96 3 29	3012	94 33 31	3003
23	Spica W.	61 46 38	2804	63 21 1	2795	64 55 35	2788	66 30 19	2779
	α Aquilæ E.	43 0 39	3801	41 45 38	3857	40 31 35	3920	39 18 36	3992
	Fomalhaut E.	71 21 14	3332	69 57 40	3334	68 34 8	3338	67 10 40	3343
	α Pegasi E.	87 1 4	2963	85 30 5	2956	83 58 57	2948	82 27 39	2941
24	Spica W.	74 26 49	2736	76 2 41	2728	77 38 44	2719	79 14 59	2710
	Antares W.	29 38 21	2862	31 11 28	2843	32 45 0	2824	34 18 56	2807
	Fomalhaut E.	60 15 11	3386	58 52 38	3400	57 30 21	3415	56 8 21	3433

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}	P. L. of Diff.	VI^{h}	P. L. of Diff.	IX^{h}	P. L. of Diff.
24	α Pegasi	E.	80° 56′ 12″	2934	79° 24′ 36″	2927	77° 52′ 52″	2921	76° 21′ 0″	2914
	Mars	E.	115 38 27	3039	114 9 3	3030	112 39 28	3021	111 9 41	3012
	Venus	E.	121 34 55	3206	120 8 53	3197	118 42 40	3167	117 16 15	3177
25	Spica	W.	80 51 26	2701	82 28 5	2692	84 4 56	2683	85 41 59	2674
	Antares	W.	35 53 15	2791	37 27 55	2776	39 2 54	2761	40 38 13	2747
	Fomalhaut	E.	54 46 42	3454	53 25 26	3477	52 4 36	3503	50 44 15	3533
	α Pegasi	E.	68 39 43	2887	67 7 7	2883	65 34 26	2879	64 1 40	2875
	Mars	E.	103 37 52	2965	102 6 55	2954	100 35 45	2945	99 4 23	2935
	Venus	E.	110 1 15	3128	108 33 39	3118	107 5 51	3107	105 37 50	3097
	α Arietis	E.	111 50 41	2769	110 15 33	2759	108 40 11	2748	107 4 35	2738
26	Spica	W.	93 50 19	2627	95 28 37	2618	97 7 8	2607	98 45 53	2596
	Antares	W.	48 39 18	2682	50 16 22	2670	51 53 42	2658	53 31 18	2646
	Fomalhaut	E.	44 12 15	3752	42 56 23	3815	41 41 36	3886	40 28 2	3967
	α Pegasi	E.	56 16 51	2865	54 43 47	2866	53 10 44	2867	51 37 43	2869
	Mars	E.	91 24 24	2885	89 51 46	2874	88 18 54	2864	86 45 49	2854
	Venus	E.	98 14 39	3046	96 45 23	3034	95 15 53	3023	93 46 9	3012
	α Arietis	E.	99 3 15	2688	97 26 19	2677	95 49 9	2667	94 11 45	2657
	Sun	E.	128 46 41	2960	127 15 38	2950	125 44 22	2939	124 12 52	2928
27	Antares	W.	61 43 17	2588	63 22 28	2577	65 1 55	2566	66 41 37	2554
	α Pegasi	E.	43 53 55	2904	42 21 41	2916	40 49 43	2933	39 18 6	2954
	Mars	E.	78 57 2	2801	77 22 35	2789	75 47 53	2778	74 12 57	2768
	α Arietis	E.	86 1 25	2608	84 22 41	2598	82 43 43	2588	81 4 32	2578
	Venus	E.	86 14 6	2957	84 43 0	2946	83 11 40	2935	81 40 5	2923
	Sun	E.	116 32 1	2874	114 59 9	2863	113 26 3	2852	111 52 43	2841
28	Antares	W.	75 4 3	2498	76 45 19	2487	78 26 51	2476	80 8 38	2465
	α Aquilæ	W.	32 13 18	4305	33 20 6	4131	34 29 38	3977	35 41 40	3843
	Mars	E.	66 14 38	2712	64 38 14	2700	63 1 34	2689	61 24 39	2677
	α Arietis	E.	72 45 14	2530	71 4 42	2520	69 23 57	2512	67 43 0	2503
	Venus	E.	73 58 32	2866	72 25 29	2853	70 52 10	2841	69 18 36	2830
	Sun	E.	104 2 22	2784	102 27 33	2772	100 52 29	2761	99 17 10	2750
29	Antares	W.	88 41 30	2410	90 24 51	2398	92 8 28	2388	93 52 20	2377
	α Aquilæ	W.	42 12 29	3352	43 35 41	3281	45 0 15	3215	46 26 6	3156
	Mars	E.	53 16 15	2621	51 37 48	2609	49 59 5	2598	48 20 7	2586
	α Arietis	E.	59 15 10	2460	57 33 1	2453	55 50 42	2445	54 8 12	2438
	Venus	E.	61 26 56	2771	59 51 50	2759	58 16 28	2747	56 40 51	2735
	Sun	E.	91 16 45	2692	89 39 54	2680	88 2 47	2668	86 25 24	2657
30	Antares	W.	102 35 25	2326	104 20 46	2317	106 6 21	2307	107 52 10	2298
	α Aquilæ	W.	53 51 31	2923	55 23 21	2887	56 55 57	2852	58 29 17	2821
	Mars	E.	40 1 27	2532	38 20 58	2521	36 40 14	2511	34 59 16	2501
	α Arietis	E.	45 33 35	2415	43 50 22	2412	42 7 5	2412	40 23 47	2412
	Venus	E.	48 38 52	2678	47 1 43	2667	45 24 19	2657	43 46 41	2646
	Sun	E.	78 14 42	2601	76 35 48	2590	74 56 39	2580	73 17 16	2569
31	α Aquilæ	W.	66 25 24	2692	68 2 14	2672	69 39 32	2653	71 17 15	2635
	Fomalhaut	W.	40 0 51	3524	41 20 49	3422	42 42 40	3339	44 6 14	3252
	Venus	E.	35 34 57	2595	33 55 56	2587	32 16 43	2578	30 37 18	2569
	Sun	E.	64 56 47	2520	63 16 1	2510	61 35 2	2502	59 53 51	2494

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
24	α Pegasi	E.	74° 48′ 59″	2909	73° 16′ 51″	2202	71° 44′ 35″	2697	70° 12′ 12″	2292
	Mars	E.	109 39 43	3002	108 9 33	2993	106 39 11	2983	105 8 37	2974
	Venus	E.	115 49 39	3167	114 22 51	3157	112 55 51	3148	111 28 39	3138
25	Spica	W.	87 19 14	2665	88 56 41	2655	90 34 21	2646	92 12 14	2637
	Antares	W.	42 13 51	2733	43 49 47	2720	45 26 0	2707	47 2 31	2695
	Fomalhaut	E.	49 24 27	3567	48 5 17	3605	46 46 48	3649	45 29 6	3696
	α Pegasi	E.	62 28 49	2872	60 55 54	2869	59 22 55	2867	57 49 54	2866
	Mars	E.	97 32 48	2925	96 1 1	2915	94 29 1	2905	92 56 49	2895
	Venus	E.	104 9 37	3087	102 41 11	3077	101 12 33	3066	99 43 42	3056
	α Arietis	E.	105 28 46	2728	103 52 43	2718	102 16 27	2708	100 39 58	2698
26	Spica	W.	100 24 51	2588	102 4 2	2578	103 43 27	2568	105 23 6	2558
	Antares	W.	55 9 10	2635	56 47 18	2623	58 25 42	2611	60 4 22	2600
	Fomalhaut	E.	39 15 50	4060	38 5 9	4164	36 56 9	4284	35 49 2	4421
	α Pegasi	E.	50 4 44	2872	48 31 49	2877	46 59 1	2884	45 26 22	2894
	Mars	E.	85 12 31	2843	83 38 59	2833	82 5 14	2822	80 31 15	2811
	Venus	E.	92 16 11	3001	90 46 0	2991	89 15 36	2980	87 44 58	2969
	α Arietis	E.	92 34 8	2647	90 56 17	2637	89 18 13	2628	87 39 56	2618
	Sun	E.	122 41 9	2918	121 9 13	2907	119 37 3	2896	118 4 39	2885
27	Antares	W.	68 21 35	2543	70 1 49	[illegible]	71 42 18	2520	73 23 3	2509
	α Pegasi	E.	37 46 55	2977	36 16 14	[illegible]	34 46 8	3040	33 16 45	3083
	Mars	E.	72 37 47	2756	71 2 22	[illegible]	69 26 42	2734	67 50 47	2723
	α Arietis	E.	79 25 7	2569	77 45 29	[illegible]	76 5 37	2549	74 25 32	2540
	Venus	E.	80 8 16	2912	78 36 12	2900	77 3 53	2889	75 31 20	2877
	Sun	E.	110 19 8	2830	108 45 19	2818	107 11 15	2807	105 36 56	2795
28	Antares	W.	81 50 41	2453	83 33 0	2442	85 15 34	2431	86 58 24	2420
	α Aquilæ	W.	36 55 58	3722	38 12 22	3613	39 30 42	3517	40 50 47	3430
	Mars	E.	59 47 29	2666	58 10 4	2654	56 32 23	2643	54 54 27	2632
	α Arietis	E.	66 1 51	2494	64 20 29	2485	62 38 54	2477	60 57 8	2468
	Venus	E.	67 44 47	2818	66 10 42	2806	64 36 22	2795	63 1 47	2782
	Sun	E.	97 41 36	2738	96 5 46	2726	94 29 41	2715	92 53 21	2703
29	Antares	W.	95 36 27	2367	97 20 49	2357	99 5 26	2346	100 50 18	2336
	α Aquilæ	W.	47 53 8	3101	49 21 16	3051	50 50 25	3005	52 20 31	2962
	Mars	E.	46 40 53	2575	45 1 24	2564	43 21 40	2553	41 41 41	2543
	α Arietis	E.	52 25 32	2432	50 42 43	2427	48 59 47	2422	47 16 44	2418
	Venus	E.	55 4 58	2724	53 28 50	2712	51 52 26	2701	50 15 47	2689
	Sun	E.	84 47 46	2646	83 9 53	2635	81 31 45	2623	79 53 21	2612
30	Antares	W.	109 38 12	2289	111 24 27	2281	113 10 55	2272	114 57 36	2264
	α Aquilæ	W.	60 3 18	2791	61 37 58	2763	63 13 14	2738	64 49 3	2714
	Mars	E.	33 18 4	2492	31 36 39	2482	29 55 0	2472	28 13 8	2464
	α Arietis	E.	38 40 30	2415	36 57 17	2419	35 14 10	2426	33 31 13	2436
	Venus	E.	42 8 48	2635	40 30 41	2625	38 52 20	2615	37 13 45	2605
	Sun	E.	71 37 38	2558	69 57 46	2548	68 17 40	2538	66 37 20	2529
31	α Aquilæ	W.	72 55 23	2618	74 33 53	2603	76 12 44	2589	77 51 54	2577
	Fomalhaut	W.	45 31 22	3180	46 57 55	3114	48 25 47	3056	49 54 51	3001
	Venus	E.	28 57 41	2561	27 17 53	2554	25 37 55	2548	23 57 48	2542
	Sun	E.	58 12 29	2485	56 30 55	2477	54 49 10	2470	53 7 15	2464

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	4 36 1.23	10.232	N.22 2 56.9	+20.48	15 48.36	68.41	2 28.99	0.374
Sat.	2	4 40 7.00	10.250	22 10 57.0	19.52	15 48.22	68.46	2 19.80	0.392
Sun.	3	4 44 13.17	10.266	22 18 33.9	18.55	15 48.09	68.51	2 10.21	0.408
Mon.	4	4 48 19.72	10.281	22 25 47.5	+17.57	15 47.96	68.56	2 0.25	0.423
Tues.	5	4 52 26.64	10.295	22 32 37.7	16.59	15 47.83	68.61	1 49.92	0.437
Wed.	6	4 56 33.89	10.308	22 39 4.2	15.60	15 47.72	68.65	1 39.26	0.450
Thur.	7	5 0 41.44	10.321	22 45 6.9	+14.60	15 47.61	68.69	1 28.29	0.463
Frid.	8	5 4 49.27	10.332	22 50 45.6	13.60	15 47.50	68.73	1 17.05	0.474
Sat.	9	5 8 57.38	10.342	22 56 0.3	12.59	15 47.40	68.77	1 5.54	0.484
Sun.	10	5 13 5.72	10.351	23 0 50.8	+11.58	15 47.30	68.80	0 53.79	0.493
Mon.	11	5 17 14.29	10.360	23 5 17.0	10 57	15 47.21	68.83	0 41.81	0.502
Tues.	12	5 21 23.04	10.368	23 9 18.9	9.55	15 47.12	68.86	0 29.64	0.510
Wed.	13	5 25 31.96	10.375	23 12 56.3	+ 8.53	15 47.04	68.89	0 17.31	0.517
Thur.	14	5 29 41.03	10.380	[illegible] 16 9.1	7.51	15 46.96	68.92	0 4.84	0.522
Frid.	15	5 33 50.23	10.385	[illegible] 57.3	6.49	15 46.88	68.94	0 7.77	0.527
Sat.	16	5 37 59.52	10.388	[illegible] 21 20.8	+ 5.47	15 46 81	68.96	0 20.47	0.531
Sun.	17	5 42 8.90	10.392	23 23 19.7	4.44	15 46.74	68.97	0 33.26	0.534
Mon.	18	5 46 18.34	10.394	23 24 53.9	3.41	15 46.67	68.98	0 46.11	0.536
Tues.	19	5 50 27.83	10.396	23 26 3.3	+ 2.37	15 46.61	68.98	0 59.01	0.538
Wed.	20	5 54 37.35	10.396	23 26 47.8	1.34	15 46.55	68.98	1 11.93	0.538
Thur.	21	5 58 46.88	10.396	23 27 7.5	+ 0.30	15 46.50	68.98	1 24.87	0.538
Frid.	22	6 2 56.39	10.395	23 27 2.4	− 0.73	15 46.45	68.98	1 37.78	0.537
Sat.	23	6 7 5.84	10.394	23 26 32.4	1.76	15 46.40	68.97	1 50.65	0.536
Sun.	24	6 11 15.25	10.391	23 25 37.6	2.79	15 46.35	68.96	2 3.46	0.533
Mon.	25	6 15 24.59	10.387	23 24 18.1	− 3.82	15 46.31	68.94	2 16.21	0.529
Tues.	26	6 19 33.84	10.382	23 22 33.9	4.85	15 46.27	68.92	2 28.86	0.524
Wed.	27	6 23 42.96	10.376	23 20 25.0	5.88	15 46.24	68.90	2 41.39	0.518
Thur.	28	6 27 51.94	10.369	23 17 51.4	− 6.92	15 46.21	68.88	2 53.78	0.511
Frid.	29	6 32 0.76	10.362	23 14 53.3	7.94	15 46.18	68.86	3 6.01	0.504
Sat.	30	6 36 9.39	10.354	23 11 30.7	8.96	15 46.16	68.83	3 18.05	0.496
Sun.	31	6 40 17.81	10.345	N.23 7 43.7	− 9.97	15 46.15	68.79	3 29.88	0.486

Note.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	4 36 1.66	10.231	N. 22 2 57.7	+20.48	2 28.98	0.374	4 38 30.64
Sat.	2	4 40 7.41	10.249	22 10 57.7	19.52	2 19.79	0.392	4 42 27.20
Sun.	3	4 44 13.55	10.265	22 18 34.6	18.55	2 10.20	0.408	4 46 23.75
Mon.	4	4 48 20.07	10.280	22 25 48.1	+17.57	2 0.24	0.423	4 50 20.31
Tues.	5	4 52 26.96	10.294	22 32 38.2	16.59	1 49.91	0.437	4 54 16.87
Wed.	6	4 56 34.18	10.307	22 39 4.6	15.60	1 39.25	0.450	4 58 13.43
Thur.	7	5 0 41.70	10.320	22 45 7.2	+14.60	1 28.28	0.463	5 2 9.98
Frid.	8	5 4 49.50	10.331	22 50 45.9	13.60	1 17.04	0.474	5 6 6.54
Sat.	9	5 8 57.57	10.341	22 56 0.5	12.59	1 5.53	0.484	5 10 3.10
Sun.	10	5 13 5.88	10.350	23 0 51.0	+11.58	0 53.78	0.493	5 13 59.66
Mon.	11	5 17 14.41	10.360	23 5 17.1	10.57	0 41.80	0.502	5 17 56.21
Tues.	12	5 21 23.13	10.367	23 9 18.9	9.55	0 29.64	0.510	5 21 52.77
Wed.	13	5 25 32.02	10.374	23 12 56.3	+ 8.53	0 17.31	0.517	5 25 49.33
Thur.	14	5 29 41.05	10.379	23 16 9.2	7.51	0 4.84	0.522	5 29 45.89
Frid.	15	5 33 50.21	10.384	23 18 57.3	6.48	0 7.77	0.527	5 33 42.44
Sat.	16	5 37 59.47	10.387	23 21 20.8	+ 5.47	0 20.47	0.531	5 37 39.00
Sun.	17	5 42 8.81	10.391	23 23 19.7	4.44	0 33.25	0.534	5 41 35.56
Mon.	18	5 46 18.22	10.393	23 24 53.9	3.41	0 46.10	0.536	5 45 32.12
Tues.	19	5 50 27.67	10.395	23 26 3.3	+ 2 37	0 59.00	0.538	5 49 28.67
Wed.	20	5 54 37.15	10.395	23 26 47.8	1.34	1 11.92	0.538	5 53 25.23
Thur.	21	5 58 46.64	10.395	23 27 7.5	+ 0.30	1 24.86	0.538	5 57 21.78
Frid.	22	6 2 56.11	10.394	23 27 2.4	− 0.73	1 37.77	0.537	6 1 18.34
Sat.	23	6 7 5.53	10.393	23 26 32.5	1.76	1 50.64	0.536	6 5 14.89
Sun.	24	6 11 14.90	10.390	23 25 37.8	2.79	2 3.45	0.533	6 9 11.45
Mon.	25	6 15 24.20	10.386	23 24 18.3	− 3.82	2 16.19	0.529	6 13 8.01
Tues.	26	6 19 33.41	10.381	23 22 34.1	4.85	2 28.84	0.524	6 17 4.57
Wed.	27	6 23 42.50	10.375	23 20 25.3	5.88	2 41.37	0.518	6 21 1.13
Thur.	28	6 27 51.44	10.368	23 17 51.8	− 6.92	2 53.76	0.511	6 24 57.69
Frid.	29	6 32 0.23	10.361	23 14 53.7	7.94	3 5.99	0.504	6 28 54.24
Sat.	30	6 36 8.82	10.353	23 11 31.2	8.96	3 18.02	0.496	6 32 50.80
Sun.	31	6 40 17.21	10.344	N. 23 7 44.3	− 9.97	3 29.85	0.486	6 36 47.36

Note—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

Diff. for 1 Hour,
$+ 9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.								Mean Time of Sidereal Noon.
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	152	70 36 43.8	36 12.4	143.71	+ 0.27	0.0062027	+26.8	19 18 19.07
2	153	71 34 12.4	33 40.8	143.68	+ 0.13	0.0062660	25.9	19 14 23.16
3	154	72 31 40.2	31 8.4	143.64	— 0.01	0.0063271	25.0	19 10 27.25
4	155	73 29 7.1	28 35.1	143.61	— 0.14	0.0063859	+24.0	19 6 31.34
5	156	74 26 33.2	26 1.1	143.57	0.27	0.0064423	23.0	19 2 35.43
6	157	75 23 58.4	23 26.2	143.54	0.38	0.0064961	22.0	18 58 39.52
7	158	76 21 22.8	20 50.4	143.50	— 0.45	0.0065474	+20.9	18 54 43.61
8	159	77 18 46.2	18 13.6	143.46	0.50	0.0065963	19.9	18 50 47.69
9	160	78 16 8.7	15 35.9	143.42	0.52	0.0066428	18.9	18 46 51.77
10	161	79 13 30 2	12 57.3	143.38	— 0.51	0.0066871	+18.0	18 42 55.85
11	162	80 10 50.7	10 17.7	143.34	0.47	0.0067292	17.1	18 38 59.95
12	163	81 8 10.2	7 37.0	143.30	0.41	0.0067692	16.2	18 35 4.05
13	164	82 5 28.8	4 55.4	143.26	— 0.33	0.0068071	+15.4	18 31 8.13
14	165	83 2 46.6	2 13.0	143.22	0.21	0.0068432	14.7	18 27 12.22
15	166	83 60 3.5	59 29.8	143.19	— 0.09	0.0068776	14.0	18 23 16.31
16	167	84 57 19.6	56 45.8	143.16	+ 0.04	0.0069103	+13.3	18 19 20.41
17	168	85 54 35.0	54 1.0	143.13	0.17	0.0069415	12.7	18 15 24.49
18	169	86 51 49.7	51 15.5	143.10	0.30	0.0069712	12.1	18 11 28.58
19	170	87 49 3.8	48 29.4	143.08	+ 0.40	0.0069996	+11.5	18 7 32.67
20	171	88 46 17.4	45 42.9	143.06	0.50	0.0070265	10.9	18 3 36.77
21	172	89 43 30.6	42 56.0	143.04	0.56	0.0070519	10.3	17 59 40.85
22	173	90 40 43.5	40 8.7	143.03	+ 0.57	0.0070759	+ 9.7	17 55 44.94
23	174	91 37 56.2	37 21.2	143.02	0.57	0.0070984	9.1	17 51 49.03
24	175	92 35 8.7	34 33.5	143.02	0.54	0.0071195	8.4	17 47 53.12
25	176	93 32 21.1	31 45.8	143.02	+ 0.49	0.0071389	+ 7.7	17 43 57.20
26	177	94 29 33.6	28 58.1	143.02	0.40	0.0071566	6.9	17 40 1.29
27	178	95 26 46.1	26 10.4	143.02	0.30	0.0071723	6.1	17 36 5.38
28	179	96 23 58.7	23 22.8	143.02	+ 0.17	0.0071860	+ 5.3	17 32 9.47
29	180	97 21 11.4	20 35.3	143.03	+ 0.04	0.0071977	4.4	17 28 13.55
30	181	98 18 24.2	17 48.0	143.03	— 0.09	0.0072071	3.4	17 24 17.64
31	182	99 15 37.1	15 0.8	143.04	— 0.22	0.0072141	+ 2.4	17 20 21.73

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 24.5	16 26.7	60 6.5	+ 0.76	60 14.4	+ 0.53	21 16.8	2.36	25.6
2	16 28.0	16 28.4	60 19.3	+ 0.27	60 20.9	− 0.02	22 14.5	2.45	26.6
3	16 27.9	16 26.4	60 19.0	− 0.31	60 13.6	0.60	23 14.0	2.50	27.6
4	16 24.0	16 20.6	60 4.6	− 0.89	59 52.2	− 1.17	☌		28.6
5	16 16.4	16 11.3	59 36.6	1.42	59 18.1	1.65	0 14.0	2.49	0.2
6	16 5.6	15 59.5	58 57.2	1.82	58 34.5	1.96	1 12.9	2.40	1.2
7	15 52.9	15 46.1	58 10.3	− 2.06	57 45.3	− 2.10	2 9.2	2.28	2.2
8	15 39.2	15 32.4	57 20.1	2.11	56 55.1	2.07	3 2.1	2.13	3.2
9	15 25.8	15 19.5	56 30.8	1.97	56 7.6	1.87	3 51.6	1.99	4.2
10	15 13.6	15 8.2	55 45.9	− 1.73	55 26.1	− 1.57	4 38.1	1.88	5.2
11	15 3.3	14 59.1	55 8.3	1.39	54 52.7	1.20	5 22.3	1.81	6.2
12	14 55.5	14 52.6	54 39.6	0.99	54 29.0	0.77	6 5.1	1.76	7.2
13	14 50.4	14 48.9	54 20.9	− 0.57	54 15.3	− 0.36	6 47.3	1.76	8.2
14	14 48.1	14 47.9	54 12.3	− 0.15	54 11.7	+ 0.04	7 29.8	1.79	9.2
15	14 48.4	14 49.5	54 13.4	+ 0.24	54 17.4	0.42	8 13.4	1.84	10.2
16	14 51.1	14 53.2	54 23.4	+ 0.57	54 31.3	+ 0.73	8 58.5	1.92	11.2
17	14 55.9	14 58.9	54 41.0	0.87	54 52.2	0.98	9 45.6	2.01	12.2
18	15 2.3	15 6.0	55 4.6	1.08	55 18.2	1.17	10 34.7	2.09	13.2
19	15 9.9	15 14.0	55 32.6	+ 1.22	55 47.6	+ 1.27	11 25.6	2.15	14.2
20	15 18.2	15 22.5	56 3.1	1.30	56 18.8	1.31	12 17.7	2.18	15.2
21	15 26.8	15 31.0	56 34.5	1.30	56 50.0	1.28	13 10.2	2.18	16.2
22	15 35.2	15 39.2	57 5.3	+ 1.26	57 20.2	+ 1.22	14 2.3	2.16	17.2
23	15 43.2	15 47.0	57 34.7	1.18	57 48.6	1.13	14 53.7	2.12	18.2
24	15 50.6	15 54.0	58 1.9	1.08	58 14.6	1.03	15 44.4	2.10	19.2
25	15 57.3	16 0.4	58 26.6	+ 0.97	58 37.9	+ 0.91	16 34.6	2.09	20.2
26	16 3.2	16 5.9	58 48.4	0.84	58 58.1	0.77	17 25.0	2.12	21.2
27	16 8.3	16 10.4	59 6.9	0.69	59 14.7	0.60	18 16.4	2.17	22.2
28	16 12.2	16 13.7	59 21.4	+ 0.50	59 26.7	+ 0.38	19 9.4	2.25	23.2
29	16 14.7	16 15.3	59 30.6	+ 0.26	59 32.8	+ 0.11	20 4.4	2.34	24.2
30	16 15.4	16 15.0	59 33.2	− 0.05	59 31.6	− 0.22	21 1.4	2.41	25.2
31	16 14.0	16 12.3	59 27.8	− 0.42	59 21.7	− 0.60	21 59.7	2.44	26.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 1.					**SUNDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 7 55.00	2.3518	N. 9 19 58.4	10.995	0	3 5 1.50	2.5209	N.16 41 48.7	6.906
1	1 10 16.22	2.3554	9 30 56.5	10.941	1	3 7 32.84	2.5237	16 48 39.6	6.791
2	1 12 37.65	2.3590	9 41 51.3	10.887	2	3 10 4.34	2.5263	16 55 23.6	6.675
3	1 14 59.30	2.3627	9 52 42.9	10.832	3	3 12 35.99	2.5288	17 2 0.6	6.557
4	1 17 21.17	2.3664	10 3 31.1	10.774	4	3 15 7.80	2.5313	17 8 30.5	6.439
5	1 19 43.27	2.3701	10 14 15.8	10.716	5	3 17 39.75	2.5337	17 14 53.3	6.319
6	1 22 5.59	2.3738	10 24 57.0	10.656	6	3 20 11.85	2.5361	17 21 8.8	6.198
7	1 24 28.13	2.3776	10 35 34.5	10.594	7	3 22 44.09	2.5384	17 27 17.1	6.077
8	1 26 50.90	2.3813	10 46 8.3	10.531	8	3 25 16.46	2.5407	17 33 18.1	5.955
9	1 29 13.89	2.3851	10 56 38.2	10.466	9	3 27 48.97	2.5429	17 39 11.7	5.832
10	1 31 37.11	2.3888	11 7 4.2	10.400	10	3 30 21.61	2.5449	17 44 57.9	5.708
11	1 34 0.55	2.3926	11 17 26.2	10.333	11	3 32 54.36	2.5468	17 50 36.6	5.583
12	1 36 24.22	2.3964	11 27 44.2	10.265	12	3 35 27.23	2.5487	17 56 7.9	5.458
13	1 38 48.12	2.4002	11 37 58.0	10.195	13	3 38 0.21	2.5506	18 1 31.6	5.332
14	1 41 12.24	2.4039	11 48 7.6	10.123	14	3 40 33.30	2.5524	18 6 47.7	5.204
15	1 43 36.59	2.4077	11 58 12.8	10.050	15	3 43 6.50	2.5541	18 11 56.1	5.076
16	1 46 1.17	2.4115	12 8 13.6	9.977	16	3 45 39.79	2.5556	18 16 56.8	4.948
17	1 48 25.97	2.4153	12 18 10.0	9.902	17	3 48 13.17	2.5571	18 21 49.8	4.819
18	1 50 51.00	2.4191	12 28 1.8	9.824	18	3 50 46.64	2.5585	18 26 35.1	4.689
19	1 53 16.26	2.4228	12 37 48.9	9.746	19	3 53 20.19	2.5597	18 31 12.5	4.558
20	1 55 41.74	2.4265	12 47 31.3	9.666	20	3 55 53.81	2.5609	18 35 42.1	4.427
21	1 58 7.44	2.4303	12 57 8.8	9.584	21	3 58 27.50	2.5620	18 40 3.8	4.296
22	2 0 33.37	2.4340	13 6 41.4	9.502	22	4 1 1.25	2.5631	18 44 17.6	4.163
23	2 2 59.52	2.4377	N.13 16 9.0	9.418	23	4 3 35.07	2.5641	N.18 48 23.4	4.031
	SATURDAY 2.					**MONDAY 4.**			
0	2 5 25.89	2.4413	N.13 25 31.6	9.333	0	4 6 8.94	2.5649	N.18 52 21.3	3.898
1	2 7 52.48	2.4451	13 34 49.0	9.247	1	4 8 42.86	2.5656	18 56 11.2	3.764
2	2 10 19.30	2.4488	13 44 1.2	9.158	2	4 11 16.81	2.5662	18 59 53.0	3.630
3	2 12 46.34	2.4524	13 53 8.0	9.068	3	4 13 50.80	2.5668	19 3 26.8	3.496
4	2 15 13.59	2.4560	14 2 9.4	8.978	4	4 16 24.82	2.5672	19 6 52.5	3.361
5	2 17 41.06	2.4596	14 11 5.4	8.887	5	4 18 58.86	2.5674	19 10 10.1	3.226
6	2 20 8.75	2.4632	14 19 55.9	8.794	6	4 21 32.91	2.5676	19 13 19.6	3.091
7	2 22 36.65	2.4667	14 28 40.7	8.699	7	4 24 6.97	2.5677	19 16 21.0	2.955
8	2 25 4.76	2.4702	14 37 19.8	8.603	8	4 26 41.04	2.5678	19 19 14.2	2.818
9	2 27 33.08	2.4737	14 45 53.1	8.507	9	4 29 15.11	2.5677	19 21 59.2	2.682
10	2 30 1.61	2.4772	14 54 20.6	8.408	10	4 31 49.17	2.5675	19 24 36.0	2.545
11	2 32 30.35	2.4807	15 2 42.1	8.308	11	4 34 23.21	2.5673	19 27 4.6	2.409
12	2 34 59.29	2.4840	15 10 57.6	8.208	12	4 36 57.24	2.5669	19 29 25.1	2.272
13	2 37 28.43	2.4873	15 19 7.0	8.106	13	4 39 31.24	2.5663	19 31 37.3	2.135
14	2 39 57.77	2.4906	15 27 10.3	8.002	14	4 42 5.20	2.5657	19 33 41.3	1.998
15	2 42 27.31	2.4939	15 35 7.3	7.897	15	4 44 39.12	2.5650	19 35 37.1	1.862
16	2 44 57.04	2.4971	15 42 58.0	7.792	16	4 47 13.00	2.5642	19 37 24.7	1.725
17	2 47 26.96	2.5002	15 50 42.4	7.686	17	4 49 46.83	2.5632	19 39 4.1	1.587
18	2 49 57.07	2.5034	15 58 20.3	7.578	18	4 52 20.59	2.5621	19 40 35.2	1.450
19	2 52 27.37	2.5065	16 5 51.7	7.468	19	4 54 54.28	2.5610	19 41 58.1	1.313
20	2 54 57.85	2.5094	16 13 16.5	7.358	20	4 57 27.91	2.5598	19 43 12.8	1.177
21	2 57 28.50	2.5123	16 20 34.7	7.247	21	5 0 1.46	2.5584	19 44 19.3	1.040
22	2 59 59.33	2.5152	16 27 46.2	7.135	22	5 2 34.92	2.5570	19 45 17.6	0.903
23	3 2 30.33	2.5181	16 34 50.9	7.021	23	5 5 8.30	2.5555	19 46 7.7	0.767
24	3 5 1.50	2.5209	N.16 41 48.7	6.906	24	5 7 41.58	2.5538	N.19 46 49.6	0.631

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 5.					**THURSDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 7 41.58	2.5538	N.19 46 49.6	0.631	0	7 6 35.96	2.3719	N.17 49 42.1	5.219
1	5 10 14.75	2.5520	19 47 23.4	0.495	1	7 8 58.11	2.3666	17 44 25.9	5.319
2	5 12 47.82	2.5502	19 47 49.0	0.358	2	7 11 19.95	2.3613	17 39 3.8	5.418
3	5 15 20.77	2.5482	19 48 6.4	0.222	3	7 13 41.47	2.3560	17 33 35.8	5.516
4	5 17 53.60	2.5461	19 48 15.7	+ 0.087	4	7 16 2.67	2.3507	17 28 1.9	5.613
5	5 20 26.30	2.5438	19 48 16.9	− 0.047	5	7 18 23.55	2.3453	17 22 22.2	5.708
6	5 22 58.86	2.5416	19 48 10.0	0.182	6	7 20 44.10	2.3398	17 16 36.9	5.803
7	5 25 31.28	2.5393	19 47 55.1	0.316	7	7 23 4.33	2.3344	17 10 45.9	5.897
8	5 28 3.56	2.5368	19 47 32.1	0.450	8	7 25 24.23	2.3289	17 4 49.3	5.989
9	5 30 35.69	2.5342	19 47 1.1	0.583	9	7 27 43.80	2.3235	16 58 47.2	6.081
10	5 33 7.66	2.5315	19 46 22.1	0.716	10	7 30 3.05	2.3181	16 52 39.6	6.171
11	5 35 39.47	2.5287	19 45 35.2	0.848	11	7 32 21.97	2.3126	16 46 26.7	6.259
12	5 38 11.10	2.5258	19 44 40.3	0.980	12	7 34 40.56	2.3071	16 40 8.5	6.347
13	5 40 42.56	2.5228	19 43 37.6	1.111	13	7 36 58.82	2.3016	16 33 45.0	6.434
14	5 43 13.84	2.5198	19 42 27.0	1.242	14	7 39 16.75	2.2960	16 27 16.4	6.519
15	5 45 44.94	2.5166	19 41 8.5	1.373	15	7 41 34.34	2.2904	16 20 42.7	6.603
16	5 48 15.84	2.5133	19 39 42.2	1.503	16	7 43 51.60	2.2849	16 14 4.0	6.687
17	5 50 46.54	2.5100	19 38 8.2	1.631	17	7 46 8.53	2.2794	16 7 20.2	6.771
18	5 53 17.04	2.5067	19 36 26.5	1.759	18	7 48 25.13	2.2739	16 0 31.5	6.852
19	5 55 47.34	2.5032	19 34 37.1	1.887	19	7 50 41.40	2.2683	15 53 38.0	6.932
20	5 58 17.43	2.4996	19 32 40.1	2.014	20	7 52 57.33	2.2627	15 46 39.7	7.010
21	6 0 47.30	2.4959	19 30 35.4	2.141	21	7 55 12.93	2.2572	15 39 36.8	7.088
22	6 3 16.94	2.4922	19 28 23.2	2.266	22	7 57 28.20	2.2517	15 32 29.2	7.165
23	6 5 46.36	2.4884	N.19 26 3.5	2.390	23	7 59 43.14	2.2462	N.15 25 17.0	7.240
	WEDNESDAY 6.					**FRIDAY 8.**			
0	6 8 15.55	2.4845	N.19 23 36.4	2.513	0	8 1 57.74	2.2406	N.15 18 0.4	7.314
1	6 10 44.50	2.4805	19 21 1.9	2.637	1	8 4 12.01	2.2352	15 10 39.3	7.388
2	6 13 13.21	2.4764	19 18 20.0	2.760	2	8 6 25.96	2.2297	15 3 13.8	7.461
3	6 15 41.67	2.4723	19 15 30.7	2.882	3	8 8 39.58	2.2242	14 55 44.0	7.532
4	6 18 9.88	2.4681	19 12 34.1	3.002	4	8 10 52.87	2.2187	14 48 10.0	7.602
5	6 20 37.84	2.4638	19 9 30.4	3.122	5	8 13 5.83	2.2132	14 40 31.8	7.671
6	6 23 5.54	2.4595	19 6 19.5	3.241	6	8 15 18.46	2.2077	14 32 49.5	7.739
7	6 25 32.98	2.4551	19 3 1.5	3.358	7	8 17 30.76	2.2023	14 25 3.1	7.806
8	6 28 0.15	2.4507	18 59 36.5	3.476	8	8 19 42.74	2.1970	14 17 12.8	7.871
9	6 30 27.06	2.4462	18 56 4.4	3.593	9	8 21 54.40	2.1916	14 9 18.6	7.935
10	6 32 53.69	2.4415	18 52 25.3	3.708	10	8 24 5.73	2.1862	14 1 20.6	7.999
11	6 35 20.04	2.4368	18 48 39.4	3.822	11	8 26 16.74	2.1809	13 53 18.7	8.062
12	6 37 46.11	2.4322	18 44 46.7	3.935	12	8 28 27.44	2.1756	13 45 13.1	8.123
13	6 40 11.90	2.4274	18 40 47.2	4.048	13	8 30 37.82	2.1703	13 37 3.9	8.183
14	6 42 37.40	2.4226	18 36 40.9	4.160	14	8 32 47.88	2.1650	13 28 51.1	8.243
15	6 45 2.61	2.4177	18 32 28.0	4.270	15	8 34 57.62	2.1598	13 20 34.7	8.301
16	6 47 27.52	2.4127	18 28 8.5	4.379	16	8 37 7.05	2.1546	13 12 14.9	8.358
17	6 49 52.14	2.4078	18 23 42.5	4.488	17	8 39 16.17	2.1493	13 3 51.7	8.415
18	6 52 16.46	2.4028	18 19 9.9	4.597	18	8 41 24.97	2.1442	12 55 25.1	8.471
19	6 54 40.48	2.3977	18 14 30.9	4.703	19	8 43 33.47	2.1391	12 46 55.2	8.525
20	6 57 4.19	2.3927	18 9 45.6	4.808	20	8 45 41.66	2.1340	12 38 22.1	8.577
21	6 59 27.60	2.3877	18 4 54.0	4.912	21	8 47 49.55	2.1290	12 29 45.9	8.629
22	7 1 50.70	2.3825	17 59 56.2	5.015	22	8 49 57.14	2.1240	12 21 6.6	8.681
23	7 4 13.49	2.3772	17 54 52.2	5.117	23	8 52 4.43	2.1189	12 12 24.2	8.732
24	7 6 35.96	2.3719	N.17 49 42.1	5.219	24	8 54 11.41	2.1139	N.12 3 38.8	8.781

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 54 11.41	2.1139	N. 12 3 38.8	8.781
1	8 56 18.10	2.1091	11 54 50.5	8.829
2	8 58 24.50	2.1042	11 45 59.3	8.876
3	9 0 30.61	2.0994	11 37 5.4	8.922
4	9 2 36.43	2.0946	11 28 8.7	8.967
5	9 4 41.96	2.0898	11 19 9.3	9.012
6	9 6 47.20	2.0850	11 10 7.3	9.055
7	9 8 52.16	2.0803	11 1 2.7	9.097
8	9 10 56.84	2.0757	10 51 55.6	9.138
9	9 13 1.25	2.0712	10 42 46.1	9.179
10	9 15 5.38	2.0666	10 33 34.1	9.220
11	9 17 9.24	2.0622	10 24 19.7	9.258
12	9 19 12.84	2.0577	10 15 3.1	9.296
13	9 21 16.17	2.0532	10 5 44.2	9.333
14	9 23 19.23	2.0488	9 56 23.1	9.369
15	9 25 22.03	2.0445	9 46 59.9	9.404
16	9 27 24.57	2.0403	9 37 34.6	9.438
17	9 29 26.86	2.0361	9 28 7.3	9.472
18	9 31 28.90	2.0319	9 18 38.0	9.504
19	9 33 30.69	2.0277	9 9 6.8	9.536
20	9 35 32.23	2.0236	8 59 33.7	9.567
21	9 37 33.52	2.0196	8 49 58.7	9.598
22	9 39 34.58	2.0157	8 40 21.9	9.627
23	9 41 35.40	2.0117	N. 8 30 43.4	9.655

SUNDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 43 35.98	2.0078	N. 8 21 3.3	9.683
1	9 45 36.33	2.0040	8 11 21.5	9.710
2	9 47 36.46	2.0002	8 1 38.1	9.736
3	9 49 36.36	1.9964	7 51 53.2	9.761
4	9 51 36.03	1.9928	7 42 6.8	9.785
5	9 53 35.49	1.9892	7 32 19.0	9.808
6	9 55 34.73	1.9856	7 22 29.8	9.831
7	9 57 33.76	1.9821	7 12 39.2	9.853
8	9 59 32.58	1.9786	7 2 47.4	9.874
9	10 1 31.19	1.9752	6 52 54.3	9.895
10	10 3 29.60	1.9718	6 43 0.0	9.915
11	10 5 27.81	1.9686	6 33 4.5	9.935
12	10 7 25.83	1.9653	6 23 7.8	9.953
13	10 9 23.65	1.9621	6 13 10.1	9.970
14	10 11 21.28	1.9590	6 3 11.4	9.987
15	10 13 18.73	1.9559	5 53 11.6	10.004
16	10 15 15.99	1.9528	5 43 10.9	10.019
17	10 17 13.07	1.9498	5 33 9.3	10.033
18	10 19 9.97	1.9469	5 23 6.9	10.047
19	10 21 6.70	1.9441	5 13 3.6	10.061
20	10 23 3.26	1.9413	5 2 59.6	10.074
21	10 24 59.65	1.9385	4 52 54.8	10.086
22	10 26 55.88	1.9358	4 42 49.3	10.097
23	10 28 51.95	1.9332	4 32 43.1	10.108
24	10 30 47.86	1.9306	N. 4 22 36.3	10.118

MONDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 30 47.86	1.9306	N. 4 22 36.3	10.118
1	10 32 43.62	1.9281	4 12 28.9	10.127
2	10 34 39.23	1.9256	4 2 21.0	10.136
3	10 36 34.69	1.9232	3 52 12.6	10.144
4	10 38 30.01	1.9208	3 42 3.7	10.152
5	10 40 25.19	1.9185	3 31 54.4	10.158
6	10 42 20.23	1.9163	3 21 44.8	10.163
7	10 44 15.14	1.9141	3 11 34.8	10.169
8	10 46 9.92	1.9119	3 1 24.5	10.174
9	10 48 4.57	1.9098	2 51 13.9	10.179
10	10 49 59.10	1.9078	2 41 3.0	10.182
11	10 51 53.51	1.9058	2 30 52.0	10.185
12	10 53 47.80	1.9039	2 20 40.8	10.187
13	10 55 41.98	1.9021	2 10 29.5	10.189
14	10 57 36.05	1.9003	2 0 18.1	10.191
15	10 59 30.02	1.8986	1 50 6.6	10.192
16	11 1 23.89	1.8969	1 39 55.1	10.191
17	11 3 17.65	1.8952	1 29 43.7	10.190
18	11 5 11.31	1.8936	1 19 32.3	10.189
19	11 7 4.88	1.8922	1 9 21.0	10.187
20	11 8 58.37	1.8907	0 59 9.8	10.185
21	11 10 51.77	1.8893	0 48 58.8	10.182
22	11 12 45.09	1.8880	0 38 48.0	10.178
23	11 14 38.33	1.8867	N. 0 28 37.4	10.174

TUESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 16 31.49	1.8854	N. 0 18 27.1	10.169
1	11 18 24.58	1.8843	N. 0 8 17.1	10.164
2	11 20 17.60	1.8832	S. 0 1 52.6	10.158
3	11 22 10.56	1.8821	0 12 1.9	10.152
4	11 24 3.45	1.8811	0 22 10.8	10.145
5	11 25 56.29	1.8802	0 32 19.3	10.138
6	11 27 49.07	1.8793	0 42 27.4	10.130
7	11 29 41.80	1.8784	0 52 34.9	10.121
8	11 31 34.48	1.8776	1 2 41.9	10.112
9	11 33 27.11	1.8768	1 12 48.4	10.103
10	11 35 19.70	1.8762	1 22 54.3	10.093
11	11 37 12.25	1.8755	1 32 59.5	10.082
12	11 39 4.76	1.8749	1 43 4.1	10.071
13	11 40 57.24	1.8744	1 53 8.0	10.058
14	11 42 49.69	1.8740	2 3 11.1	10.046
15	11 44 42.12	1.8736	2 13 13.5	10.033
16	11 46 34.53	1.8732	2 23 15.1	10.020
17	11 48 26.91	1.8728	2 33 15.9	10.006
18	11 50 19.27	1.8726	2 43 15.8	9.991
19	11 52 11.62	1.8725	2 53 14.8	9.976
20	11 54 3.97	1.8724	3 3 12.9	9.961
21	11 55 56.31	1.8723	3 13 10.1	9.945
22	11 57 48.64	1.8722	3 23 6.3	9.928
23	11 59 40.97	1.8722	3 33 1.5	9.911
24	12 1 33.31	1.8723	S. 3 42 55.6	9.893

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 1 33.31	1.8723	S. 3 42 55.6	9.893
1	12 3 25.65	1.8724	3 52 48.7	9.875
2	12 5 18.00	1.8726	4 2 40.6	9.856
3	12 7 10.36	1.8728	4 12 31.4	9.837
4	12 9 2.74	1.8731	4 22 21.0	9.817
5	12 10 55.14	1.8734	4 32 9.4	9.797
6	12 12 47.55	1.8737	4 41 56.6	9.776
7	12 14 39.99	1.8742	4 51 42.5	9.754
8	12 16 32.46	1.8747	5 1 27.1	9.733
9	12 18 24.96	1.8753	5 11 10.4	9.711
10	12 20 17.50	1.8759	5 20 52.4	9.687
11	12 22 10.07	1.8765	5 30 32.9	9.663
12	12 24 2.68	1.8772	5 40 12.0	9.639
13	12 25 55.33	1.8779	5 49 49.6	9.614
14	12 27 48.03	1.8787	5 59 25.7	9.590
15	12 29 40.78	1.8796	6 9 0.4	9.565
16	12 31 33.58	1.8804	6 18 33.5	9.539
17	12 33 26.43	1.8813	6 28 5.0	9.512
18	12 35 19.34	1.8823	6 37 34.9	9.484
19	12 37 12.31	1.8833	6 47 3.1	9.456
20	12 39 5.34	1.8844	6 56 29.6	9.428
21	12 40 58.44	1.8856	7 5 54.5	9.400
22	12 42 51.61	1.8867	7 15 17.6	9.370
23	12 44 44.85	1.8879	S. 7 24 38.9	9.340

THURSDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 46 38.16	1.8892	S. 7 33 58.4	9.309
1	12 48 31.55	1.8905	7 43 16.0	9.278
2	12 50 25.02	1.8919	7 52 31.8	9.247
3	12 52 18.58	1.8933	8 1 45.7	9.215
4	12 54 12.22	1.8947	8 10 57.6	9.182
5	12 56 5.95	1.8961	8 20 7.5	9.149
6	12 57 59.76	1.8976	8 29 15.5	9.116
7	12 59 53.66	1.8993	8 38 21.4	9.081
8	13 1 47.67	1.9010	8 47 25.2	9.046
9	13 3 41.78	1.9027	8 56 26.9	9.010
10	13 5 35.99	1.9044	9 5 26.4	8.974
11	13 7 30.30	1.9061	9 14 23.8	8.938
12	13 9 24.72	1.9079	9 23 19.0	8.901
13	13 11 19.25	1.9097	9 32 11.9	8.863
14	13 13 13.89	1.9116	9 41 2.5	8.824
15	13 15 8.64	1.9135	9 49 50.8	8.786
16	13 17 3.51	1.9155	9 58 36.8	8.747
17	13 18 58.50	1.9174	10 7 20.5	8.708
18	13 20 53.60	1.9194	10 16 1.8	8.668
19	13 22 48.83	1.9216	10 24 40.6	8.626
20	13 24 44.19	1.9237	10 33 16.9	8.584
21	13 26 39.68	1.9259	10 41 50.7	8.542
22	13 28 35.30	1.9281	10 50 22.0	8.500
23	13 30 31.05	1.9302	10 58 50.7	8.456
24	13 32 26.93	1.9325	S. 11 7 16.7	8.412

FRIDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 32 26.93	1.9325	S. 11 7 16.7	8.412
1	13 34 22.95	1.9348	11 15 40.1	8.367
2	13 36 19.11	1.9372	11 24 0.8	8.322
3	13 38 15.42	1.9396	11 32 18.8	8.277
4	13 40 11.87	1.9420	11 40 34.0	8.230
5	13 42 8.46	1.9444	11 48 46.4	8.183
6	13 44 5.20	1.9469	11 56 56.0	8.136
7	13 46 2.09	1.9494	12 5 2.7	8.088
8	13 47 59.13	1.9520	12 13 6.5	8.039
9	13 49 56.33	1.9546	12 21 7.4	7.990
10	13 51 53.68	1.9572	12 29 5.3	7.940
11	13 53 51.19	1.9598	12 37 0.2	7.889
12	13 55 48.85	1.9624	12 44 52.0	7.838
13	13 57 46.68	1.9652	12 52 40.8	7.786
14	13 59 44.67	1.9679	13 0 26.4	7.734
15	14 1 42.83	1.9707	13 8 8.9	7.681
16	14 3 41.15	1.9734	13 15 48.2	7.627
17	14 5 39.64	1.9762	13 23 24.2	7.573
18	14 7 38.30	1.9791	13 30 57.0	7.519
19	14 9 37.13	1.9819	13 38 26.5	7.463
20	14 11 36.13	1.9848	13 45 52.6	7.407
21	14 13 35.31	1.9877	13 53 15.4	7.351
22	14 15 34.66	1.9907	14 0 34.7	7.294
23	14 17 34.19	1.9937	S. 14 7 50.6	7.236

SATURDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 19 33.90	1.9967	S. 14 15 3.0	7.177
1	14 21 33.79	1.9997	14 22 11.8	7.118
2	14 23 33.86	2.0027	14 29 17.1	7.058
3	14 25 34.11	2.0057	14 36 18.8	6.997
4	14 27 34.55	2.0088	14 43 16.8	6.936
5	14 29 35.17	2.0118	14 50 11.1	6.875
6	14 31 35.97	2.0149	14 57 1.8	6.813
7	14 33 36.96	2.0181	15 3 48.7	6.749
8	14 35 38.14	2.0212	15 10 31.7	6.685
9	14 37 39.51	2.0244	15 17 10.9	6.621
10	14 39 41.07	2.0276	15 23 46.2	6.557
11	14 41 42.82	2.0307	15 30 17.7	6.492
12	14 43 44.76	2.0339	15 36 45.2	6.425
13	14 45 46.89	2.0372	15 43 8.7	6.358
14	14 47 49.22	2.0404	15 49 28.2	6.291
15	14 49 51.74	2.0437	15 55 43.6	6.222
16	14 51 54.46	2.0469	16 1 54.9	6.153
17	14 53 57.37	2.0501	16 8 2.0	6.083
18	14 56 0.47	2.0533	16 14 4.9	6.013
19	14 58 3.77	2.0567	16 20 3.6	5.942
20	15 0 7.27	2.0600	16 25 58.0	5.871
21	15 2 10.97	2.0632	16 31 48.1	5.799
22	15 4 14.86	2.0665	16 37 33.9	5.727
23	15 6 18.95	2.0698	16 43 15.4	5.655
24	15 8 23.24	2.0732	S. 16 48 52.5	5.581

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 8 23.24	2.0732	S. 16 48 52.5	5.581
1	15 10 27.73	2.0764	16 54 25.1	5.506
2	15 12 32.41	2.0797	16 59 53.2	5.430
3	15 14 37.29	2.0830	17 5 16.7	5.354
4	15 16 42.37	2.0863	17 10 35.7	5.278
5	15 18 47.65	2.0896	17 15 50.1	5.201
6	15 20 53.12	2.0929	17 20 59.8	5.123
7	15 22 58.79	2.0962	17 26 4.9	5.045
8	15 25 4.66	2.0995	17 31 5.2	4.966
9	15 27 10.73	2.1027	17 36 0.8	4.887
10	15 29 16.99	2.1060	17 40 51.6	4.806
11	15 31 23.45	2.1093	17 45 37.5	4.725
12	15 33 30.11	2.1126	17 50 18.6	4.644
13	15 35 36.96	2.1158	17 54 54.8	4.562
14	15 37 44.01	2.1191	17 59 26.0	4.479
15	15 39 51.25	2.1223	18 3 52.3	4.396
16	15 41 58.68	2.1254	18 8 13.5	4.312
17	15 44 6.30	2.1287	18 12 29.7	4.227
18	15 46 14.12	2.1319	18 16 40.8	4.142
19	15 48 22.13	2.1351	18 20 46.8	4.057
20	15 50 30.33	2.1382	18 24 47.6	3.970
21	15 52 38.71	2.1413	18 28 43.2	3.883
22	15 54 47.28	2.1444	18 32 33.6	3.796
23	15 56 56.04	2.1476	S. 18 36 18.7	3.709

MONDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 59 4.99	2.1507	S. 18 39 58.6	3.621
1	16 1 14.12	2.1537	18 43 33.2	3.531
2	16 3 23.43	2.1567	18 47 2.3	3.440
3	16 5 32.93	2.1598	18 50 26.0	3.350
4	16 7 42.61	2.1628	18 53 44.3	3.259
5	16 9 52.47	2.1657	18 56 57.1	3.168
6	16 12 2.50	2.1687	19 0 4.4	3.076
7	16 14 12.71	2.1717	19 3 6.2	2.983
8	16 16 23.10	2.1746	19 6 2.4	2.890
9	16 18 33.66	2.1774	19 8 53.0	2.797
10	16 20 44.39	2.1803	19 11 38.0	2.703
11	16 22 55.29	2.1831	19 14 17.3	2.608
12	16 25 6.36	2.1858	19 16 51.0	2.513
13	16 27 17.59	2.1886	19 19 18.9	2.418
14	16 29 28.99	2.1913	19 21 41.1	2.322
15	16 31 40.55	2.1940	19 23 57.5	2.225
16	16 33 52.27	2.1967	19 26 8.1	2.128
17	16 36 4.15	2.1993	19 28 12.9	2.032
18	16 38 16.18	2.2018	19 30 11.9	1.934
19	16 40 28.37	2.2044	19 32 5.0	1.835
20	16 42 40.71	2.2069	19 33 52.1	1.736
21	16 44 53.20	2.2094	19 35 33.3	1.637
22	16 47 5.84	2.2118	19 37 8.5	1.538
23	16 49 18.62	2.2142	19 38 37.8	1.438
24	16 51 31.54	2.2165	S. 19 40 1.1	1.337

TUESDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 51 31.54	2.2165	S. 19 40 1.1	1.337
1	16 53 44.60	2.2188	19 41 18.3	1.237
2	16 55 57.80	2.2211	19 42 29.5	1.136
3	16 58 11.14	2.2234	19 43 34.6	1.034
4	17 0 24.61	2.2256	19 44 33.6	0.932
5	17 2 38.21	2.2277	19 45 26.4	0.829
6	17 4 51.93	2.2297	19 46 13.1	0.727
7	17 7 5.78	2.2318	19 46 53.6	0.624
8	17 9 19.75	2.2338	19 47 28.0	0.522
9	17 11 33.84	2.2358	19 47 56.2	0.418
10	17 13 48.05	2.2378	19 48 18.2	0.314
11	17 16 2.37	2.2397	19 48 33.9	0.210
12	17 18 16.81	2.2415	19 48 43.4	0.106
13	17 20 31.35	2.2432	19 48 46.6	− 0.001
14	17 22 46.00	2.2450	19 48 43.5	+ 0.103
15	17 25 0.75	2.2467	19 48 34.2	0.208
16	17 27 15.60	2.2483	19 48 18.5	0.314
17	17 29 30.54	2.2498	19 47 56.5	0.419
18	17 31 45.58	2.2514	19 47 28.2	0.525
19	17 34 0.71	2.2529	19 46 53.5	0.631
20	17 36 15.93	2.2543	19 46 12.5	0.737
21	17 38 31.23	2.2557	19 45 25.1	0.843
22	17 40 46.61	2.2570	19 44 31.3	0.950
23	17 43 2.07	2.2583	S. 19 43 31.1	1.056

WEDNESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 45 17.61	2.2596	S. 19 42 24.6	1.162
1	17 47 33.22	2.2608	19 41 11.7	1.269
2	17 49 48.90	2.2619	19 39 52.4	1.376
3	17 52 4.65	2.2630	19 38 26 6	1.483
4	17 54 20.46	2.2640	19 36 54.4	1.590
5	17 56 36.33	2.2650	19 35 15.8	1.697
6	17 58 52.26	2.2660	19 33 30.8	1.803
7	18 1 8.25	2.2668	19 31 39.4	1.911
8	18 3 24.28	2.2676	19 29 41.5	2.018
9	18 5 40.36	2.2683	19 27 37.2	2.125
10	18 7 56.48	2.2691	19 25 26.5	2.232
11	18 10 12.65	2.2698	19 23 9.4	2.339
12	18 12 28.86	2.2704	19 20 45.8	2.447
13	18 14 45.10	2.2710	19 18 15.8	2.553
14	18 17 1.38	2.2716	19 15 39.4	2.660
15	18 19 17.69	2.2721	19 12 56.6	2.767
16	18 21 34.03	2.2725	19 10 7.4	2.873
17	18 23 50.39	2.2728	19 7 11.8	2.980
18	18 26 6.77	2.2732	19 4 9.8	3.087
19	18 28 23.17	2.2734	19 1 1.4	3.193
20	18 30 39.58	2.2737	18 57 46.6	3.299
21	18 32 56.01	2.2739	18 54 25.5	3.405
22	18 35 12.45	2.2740	18 50 58.0	3.511
23	18 37 28.89	2.2741	18 47 24.2	3.617
24	18 39 45.34	2.2742	S. 18 43 44.0	3.723

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 21.					SATURDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 39 45.34	2.2742	S. 18 43 44.0	3.723	0	20 28 14.80	2.2357	S. 13 50 33.3	8.295
1	18 42 1.79	2.2742	18 39 57.5	3.828	1	20 30 28.90	2.2343	13 42 13.2	8.375
2	18 44 18.24	2.2741	18 36 4.7	3.933	2	20 32 42.92	2.2331	13 33 48.3	8.455
3	18 46 34.68	2.2740	18 32 5.6	4.038	3	20 34 56.87	2.2318	13 25 18.6	8.534
4	18 48 51.12	2.2739	18 28 0.2	4.143	4	20 37 10.74	2.2306	13 16 44.2	8.612
5	18 51 7.55	2.2737	18 23 48.5	4.247	5	20 39 24.54	2.2293	13 8 5.1	8.690
6	18 53 23.97	2.2735	18 19 30.6	4.350	6	20 41 38.26	2.2280	12 59 21.4	8.767
7	18 55 40.37	2.2732	18 15 6.5	4.454	7	20 43 51.90	2.2267	12 50 33.1	8.842
8	18 57 56.75	2.2729	18 10 36.2	4.558	8	20 46 5.46	2.2254	12 41 40.3	8.917
9	19 0 13.12	2.2726	18 5 59.6	4.661	9	20 48 18.95	2.2242	12 32 43.1	8.991
10	19 2 29.46	2.2722	18 1 16.9	4.763	10	20 50 32.36	2.2229	12 23 41.4	9 064
11	19 4 45.78	2.2718	17 56 28.1	4.865	11	20 52 45.70	2.2216	12 14 35.4	9.136
12	19 7 2.07	2.2713	17 51 33.1	4.967	12	20 54 58.96	2.2203	12 5 25.1	9.208
13	19 9 18.33	2.2708	17 46 32.0	5.069	13	20 57 12.14	2.2191	11 56 10.5	9.279
14	19 11 34.56	2.2703	17 41 24.8	5.170	14	20 59 25.25	2.2179	11 46 51.6	9.349
15	19 13 50.76	2.2697	17 36 11.6	5.271	15	21 1 38.29	2.2167	11 37 28.6	9.418
16	19 16 6.92	2.2690	17 30 52.3	5.372	16	21 3 51.25	2.2154	11 28 1.5	9.486
17	19 18 23.04	2.2684	17 25 27.0	5.471	17	21 6 4.14	2.2142	11 18 30.3	9.553
18	19 20 39.13	2.2677	17 19 55.8	5.570	18	21 8 16.96	2.2131	11 8 55.1	9.620
19	19 22 55.17	2.2670	17 14 18.6	5.669	19	21 10 29.71	2.2119	10 59 15.9	9.685
20	19 25 11.17	2.2662	17 8 35.5	5.767	20	21 12 42.39	2.2107	10 49 32.9	9.749
21	19 27 27.12	2.2654	17 2 46.5	5.866	21	21 14 54.99	2.2095	10 39 46.0	9.813
22	19 29 43.02	2.2646	16 56 51.6	5.964	22	21 17 7.53	2.2084	10 29 55.3	9.876
23	19 31 58.87	2.2638	S. 16 50 50.8	6.062	23	21 19 20.00	2.2072	S. 10 20 0.9	9.938
	FRIDAY 22.					SUNDAY 24.			
0	19 34 14.68	2.2630	S. 16 44 44.2	6.158	0	21 21 32.40	2.2062	S. 10 10 2.7	10.000
1	19 36 30.43	2.2620	16 38 31.8	6.254	1	21 23 44.74	2.2051	10 0 0.9	10.059
2	19 38 46.12	2.2611	16 32 13.7	6.349	2	21 25 57.01	2.2040	9 49 55.6	10.118
3	19 41 1.76	2.2602	16 25 49.9	6.444	3	21 28 9.22	2.2030	9 39 46.7	10.177
4	19 43 17.34	2.2592	16 19 20.4	6.538	4	21 30 21.37	2.2020	9 29 34.3	10.235
5	19 45 32.86	2.2581	16 12 45.3	6.632	5	21 32 33.46	2.2011	9 19 18.5	10.291
6	19 47 48.31	2.2570	16 6 4.5	6.726	6	21 34 45.50	2.2002	9 8 59.4	10.346
7	19 50 3.70	2.2560	15 59 18.2	6.819	7	21 36 57.48	2.1992	8 58 37.0	10.401
8	19 52 19.03	2.2550	15 52 26.3	6.911	8	21 39 9.40	2.1982	8 48 11.3	10.455
9	19 54 34.30	2.2539	15 45 28.9	7.002	9	21 41 21.27	2.1973	8 37 42.4	10.507
10	19 56 49.50	2.2527	15 38 26.0	7.093	10	21 43 33.08	2.1964	8 27 10.4	10.559
11	19 59 4.63	2.2516	15 31 17.7	7.183	11	21 45 44.84	2.1956	8 16 35.3	10.610
12	20 1 19.69	2.2504	15 24 4.0	7.273	12	21 47 56.55	2.1948	8 5 57.2	10.659
13	20 3 34.68	2.2493	15 16 44.9	7.362	13	21 50 8.21	2.1940	7 55 16.2	10.708
14	20 5 49.60	2.2482	15 9 20.5	7.450	14	21 52 19.83	2.1932	7 44 32.2	10.757
15	20 8 4.46	2.2470	15 1 50.9	7.538	15	21 54 31.40	2.1925	7 33 45.4	10.803
16	20 10 19.24	2.2457	14 54 16.0	7.625	16	21 56 42.93	2.1918	7 22 55.8	10.849
17	20 12 33.95	2.2445	14 46 35.9	7.711	17	21 58 54.42	2.1912	7 12 3.5	10.894
18	20 14 48.58	2.2432	14 38 50.7	7.796	18	22 1 5.88	2.1906	7 1 8.5	10.938
19	20 17 3.14	2.2420	14 31 0.4	7.882	19	22 3 17.30	2.1900	6 50 10.9	10.981
20	20 19 17.62	2.2407	14 23 4.9	7.966	20	22 5 28.68	2.1894	6 39 10.8	11.022
21	20 21 32.03	2.2395	14 15 4.4	8.049	21	22 7 40.03	2.1889	6 28 8.2	11.063
22	20 23 46.36	2.2382	14 6 59.0	8.132	22	22 9 51.35	2.1884	6 17 3.2	11.103
23	20 26 0.62	2.2370	13 58 48.6	8.214	23	22 12 2.64	2.1880	6 5 55.8	11.142
24	20 28 14.80	2.2357	S. 13 50 33.3	8.295	24	22 14 13.91	2.1876	S. 5 54 46.1	11.180

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 14 13.91	2.1876	S. 5 54 46.1	11.180
1	22 16 25.15	2.1872	5 43 34.2	11.217
2	22 18 36.37	2.1868	5 32 20.1	11.253
3	22 20 47.57	2.1865	5 21 3.8	11.288
4	22 22 58.75	2.1863	5 9 45.5	11.322
5	22 25 9.92	2.1861	4 58 25.2	11.355
6	22 27 21.08	2.1859	4 47 2.9	11.387
7	22 29 32.23	2.1857	4 35 38.7	11.417
8	22 31 43.37	2.1856	4 24 12.8	11.447
9	22 33 54.50	2.1855	4 12 45.1	11.476
10	22 36 5.63	2.1855	4 1 15.7	11.503
11	22 38 16.76	2.1856	3 49 44.7	11.530
12	22 40 27.90	2.1857	3 38 12.1	11.556
13	22 42 39.04	2.1857	3 26 38.0	11.580
14	22 44 50.19	2.1858	3 15 2.5	11.603
15	22 47 1.34	2.1860	3 3 25.6	11.626
16	22 49 12.51	2.1863	2 51 47.4	11.647
17	22 51 23.70	2.1866	2 40 7.9	11.667
18	22 53 34.90	2.1869	2 28 27.3	11.686
19	22 55 46.13	2.1873	2 16 45.6	11.704
20	22 57 57.38	2.1877	2 5 2.8	11.722
21	23 0 8.65	2.1881	1 53 19.0	11.738
22	23 2 19.95	2.1886	1 41 34.3	11.753
23	23 4 31.29	2.1892	S. 1 29 48.7	11.767

TUESDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 6 42.66	2.1898	S. 1 18 2.3	11.779
1	23 8 54.06	2.1904	1 6 15.2	11.791
2	23 11 5.51	2.1912	0 54 27.4	11.802
3	23 13 17.00	2.1919	0 42 39.0	11.811
4	23 15 28.54	2.1927	0 30 50.1	11.819
5	23 17 40.13	2.1935	0 19 0.7	11.826
6	23 19 51.76	2.1943	S. 0 7 11.0	11.832
7	23 22 3.45	2.1953	N. 0 4 39.1	11.837
8	23 24 15.20	2.1963	0 16 29.5	11.841
9	23 26 27.00	2.1973	0 28 20.0	11.844
10	23 28 38.87	2.1984	0 40 10.7	11.846
11	23 30 50.81	2.1995	0 52 1.5	11.847
12	23 33 2.81	2.2006	1 3 52.3	11.846
13	23 35 14.88	2.2018	1 15 43.0	11.844
14	23 37 27.03	2.2031	1 27 33.6	11.842
15	23 39 39.26	2.2045	1 39 24.0	11.837
16	23 41 51.57	2.2058	1 51 14.1	11.832
17	23 44 3.96	2.2072	2 3 3.9	11.826
18	23 46 16.43	2.2086	2 14 53.2	11.819
19	23 48 28.99	2.2101	2 26 42.1	11.811
20	23 50 41.64	2.2117	2 38 30.5	11.801
21	23 52 54.39	2.2132	2 50 18.2	11.790
22	23 55 7.23	2.2149	3 2 5.3	11.778
23	23 57 20.17	2.2166	3 13 51.6	11.765
24	23 59 33.22	2.2183	N. 3 25 37.1	11.751

WEDNESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 59 33.22	2.2183	N. 3 25 37.1	11.751
1	0 1 46.37	2.2201	3 37 21.7	11.736
2	0 3 59.63	2.2218	3 49 5.4	11.719
3	0 6 12.99	2.2237	4 0 48.0	11.701
4	0 8 26.47	2.2257	4 12 29.5	11.682
5	0 10 40.07	2.2277	4 24 9.9	11.663
6	0 12 53.79	2.2297	4 35 49.1	11.642
7	0 15 7.63	2.2317	4 47 27.0	11.619
8	0 17 21.59	2.2338	4 59 3.4	11.595
9	0 19 35.68	2.2359	5 10 38.4	11.571
10	0 21 49.90	2.2381	5 22 11.9	11.545
11	0 24 4.25	2.2403	5 33 43.8	11.517
12	0 26 18.74	2.2426	5 45 14.0	11.489
13	0 28 33.36	2.2448	5 56 42.5	11.460
14	0 30 48.12	2.2472	6 8 9.2	11.430
15	0 33 3.03	2.2497	6 19 34.1	11.398
16	0 35 18.08	2.2521	6 30 57.0	11.365
17	0 37 33.28	2.2545	6 42 17.9	11.331
18	0 39 48.62	2.2570	6 53 36.7	11.296
19	0 42 4.12	2.2596	7 4 53.4	11.259
20	0 44 19.77	2.2622	7 16 7.8	11.221
21	0 46 35.58	2.2648	7 27 19.9	11.182
22	0 48 51.54	2.2674	7 38 29.6	11.142
23	0 51 7.67	2.2702	N. 7 49 36.9	11.100

THURSDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 53 23.96	2.2729	N. 8 0 41.6	11.057
1	0 55 40.42	2.2757	8 11 43.7	11.013
2	0 57 57.04	2.2784	8 22 43.2	10.969
3	1 0 13.83	2.2812	8 33 40.0	10.923
4	1 2 30.79	2.2841	8 44 33.9	10.875
5	1 4 47.92	2.2870	8 55 25.0	10.827
6	1 7 5.23	2.2900	9 6 13.1	10.776
7	1 9 22.72	2.2929	9 16 58.1	10.725
8	1 11 40.38	2.2958	9 27 40.1	10.673
9	1 13 58.22	2.2988	9 38 18.9	10.620
10	1 16 16.24	2.3019	9 48 54.5	10.565
11	1 18 34.45	2.3050	9 59 26.7	10.508
12	1 20 52.84	2.3081	10 9 55.5	10.451
13	1 23 11.42	2.3112	10 20 20.9	10.393
14	1 25 30.19	2.3143	10 30 42.7	10.333
15	1 27 49.14	2.3174	10 41 0.9	10.272
16	1 30 8.28	2.3206	10 51 15.4	10.210
17	1 32 27.61	2.3238	11 1 26.1	10.147
18	1 34 47.14	2.3271	11 11 33.0	10.083
19	1 37 6.86	2.3302	11 21 36.0	10.017
20	1 39 26.77	2.3335	11 31 35.0	9.949
21	1 41 46.88	2.3368	11 41 29.9	9.881
22	1 44 7.19	2.3401	11 51 20.7	9.812
23	1 46 27.69	2.3433	12 1 7.3	9.742
24	1 48 48.39	2.3466	N. 12 10 49.7	9.670

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 48 48.39	2.3466	N.12 10 49.7	9.670
1	1 51 9.28	2.3499	12 20 27.7	9.597
2	1 53 30.38	2.3533	12 30 1.3	9.523
3	1 55 51.68	2.3567	12 39 30.4	9.448
4	1 58 13.18	2.3599	12 48 55 0	9.372
5	2 0 34.87	2.3632	12 58 15.0	9.293
6	2 2 56.76	2.3665	13 7 30.2	9.214
7	2 5 18.85	2.3698	13 16 40.7	9.135
8	2 7 41.14	2.3732	13 25 46.4	9.053
9	2 10 3.64	2.3766	13 34 47.1	8.971
10	2 12 26.33	2.3799	13 43 42.9	8.887
11	2 14 49.22	2.3832	13 52 33.6	8.802
12	2 17 12.31	2.3865	14 1 19.2	8.717
13	2 19 35.60	2.3898	14 9 59.6	8.630
14	2 21 59.09	2.3931	14 18 34.8	8.542
15	2 24 22.77	2.3963	14 27 4.6	8.452
16	2 26 46.65	2.3996	14 35 29.1	8.362
17	2 29 10.72	2.4028	14 43 48.1	8.271
18	2 31 34.99	2.4061	14 52 1.6	8.178
19	2 33 59.45	2.4093	15 0 9.5	8.085
20	2 36 24.11	2.4126	15 8 11.8	7.990
21	2 38 48.96	2.4158	15 16 8.3	7.894
22	2 41 14.00	2.4189	15 23 59.1	7.797
23	2 43 39.23	2.4220	N.15 31 44.0	7.699

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 46 4.64	2.4251	N.15 39 23.0	7.600
1	2 48 30.24	2.4282	15 46 56.0	7.500
2	2 50 56.02	2.4312	15 54 23.0	7.399
3	2 53 21.99	2.4343	16 1 43.9	7.297
4	2 55 48.14	2.4373	16 8 58.6	7.194
5	2 58 14.47	2.4402	16 16 7.2	7.091
6	3 0 40.97	2.4432	16 23 9.5	6.985
7	3 3 7.65	2.4461	16 30 5.4	6.879
8	3 5 34.50	2.4488	16 36 55.0	6.772
9	3 8 1.51	2.4516	16 43 38.1	6.664
10	3 10 28.69	2.4544	16 50 14.7	6.556
11	3 12 56.04	2.4572	16 56 44.7	6.445
12	3 15 23.55	2.4598	17 3 8.1	6.334
13	3 17 51.22	2.4624	17 9 24.8	6.222
14	3 20 19.04	2.4650	17 15 34.8	6.110
15	3 22 47.02	2.4676	17 21 38.0	5.997
16	3 25 15.15	2.4700	17 27 34.4	5.883
17	3 27 43.42	2.4723	17 33 24.0	5.769
18	3 30 11.83	2.4747	17 39 6.7	5.653
19	3 32 40.38	2.4770	17 44 42.4	5.536
20	3 35 9.07	2.4792	17 50 11.0	5.419
21	3 37 37.89	2.4814	17 55 32.6	5.301
22	3 40 6.84	2.4835	18 0 47.1	5.182
23	3 42 35.91	2.4856	18 5 54.4	5.063
24	3 45 5.11	2.4877	N.18 10 54.6	4.943

SUNDAY, JULY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 45 5.11	2.4877	N.18 10 54.6	4.943

PHASES OF THE MOON.

	d	h	m
● New Moon	4	18	12.5
☽ First Quarter . . .	12	2	41.5
○ Full Moon	20	4	31.6
☾ Last Quarter	27	7	37.7

	d	h
☾ Perigee	2	11.7
☾ Apogee	14	9.1
☾ Perigee	29	20.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Aquilæ	W.	79° 31′ 20″	2566	81° 11′ 2″	2556	82° 50′ 58″	2547	84° 31′ 6″	2540
	Fomalhaut	W.	51 25 2	2954	52 56 13	2910	54 28 19	2870	56 1 16	2834
	Sun	E.	51 25 11	2457	49 42 58	2451	48 0 36	2445	46 18 6	2440
2	α Aquilæ	W.	92 53 52	2520	94 34 38	2519	96 15 25	2520	97 56 10	2522
	Fomalhaut	W.	63 56 23	2699	65 33 4	2680	67 10 10	2664	68 47 38	2649
	Sun	E.	37 44 7	2425	36 1 8	2424	34 18 7	2423	32 35 5	2424
6	Sun	W.	17 1 55	2682	18 38 59	2688	20 15 55	2696	21 52 40	2707
	Regulus	E.	56 23 36	2346	54 38 44	2362	52 54 15	2378	51 10 9	2395
	Spica	E.	110 2 56	2318	108 17 23	2333	106 32 11	2347	104 47 20	2362
7	Sun	W.	29 52 22	2776	31 27 21	2791	33 2 0	2808	34 36 17	2824
	Regulus	E.	42 35 47	2485	40 54 13	2504	39 13 6	2524	37 32 26	2544
	Spica	E.	96 8 35	2440	94 25 58	2457	92 43 44	2473	91 1 53	2490
8	Sun	W.	42 22 17	2911	43 54 22	2928	45 26 5	2946	46 57 26	2964
	Jupiter	W.	22 51 52	2725	24 27 58	2733	26 3 54	2743	27 39 37	2754
	Regulus	E.	29 16 35	2660	27 39 2	2688	26 2 6	2717	24 25 49	2749
	Spica	E.	82 38 31	2574	80 59 0	2591	79 19 53	2608	77 41 9	2625
9	Sun	W.	54 28 37	3051	55 57 46	3068	57 26 35	3085	58 55 3	3101
	Jupiter	W.	35 34 18	2818	37 8 23	2831	38 42 10	2845	40 15 39	2860
	Pollux	W.	24 3 22	3275	25 28 3	3227	26 53 40	3190	28 20 1	3162
	Spica	E.	69 33 8	2707	67 56 38	2723	66 20 29	2739	64 44 41	2754
	Antares	E.	114 55 7	2745	113 19 27	2760	111 44 7	2775	110 9 7	2791
10	Sun	W.	66 12 26	3182	67 38 57	3196	69 5 11	3210	70 31 8	3225
	Jupiter	W.	47 58 33	2928	49 30 16	2942	51 1 42	2955	52 32 51	2967
	Pollux	W.	35 38 9	3093	37 6 27	3088	38 34 51	3086	40 3 18	3086
	Spica	E.	56 50 42	2829	55 16 52	2843	53 43 20	2856	52 10 5	2870
	Antares	E.	102 18 55	2862	100 45 48	2876	99 12 58	2889	97 40 25	2902
11	Sun	W.	77 36 44	3291	79 1 6	3303	80 25 14	3314	81 49 9	3325
	Jupiter	W.	60 4 47	3027	61 34 26	3038	63 3 52	3047	64 33 6	3057
	Pollux	W.	47 25 22	3095	48 53 38	3098	50 21 50	3101	51 49 58	3105
	Spica	E.	44 27 58	2930	42 56 17	2942	41 24 51	2953	39 53 39	2963
	Antares	E.	90 1 41	2962	88 30 41	2973	86 59 55	2985	85 29 23	2994
12	Sun	W.	88 45 43	3373	90 8 30	3382	91 31 7	3389	92 53 36	3397
	Pollux	W.	59 9 20	3127	60 36 57	3130	62 4 30	3134	63 31 58	3138
	Regulus	W.	22 7 19	3138	23 34 42	3131	25 2 14	3125	26 29 53	3121
	Spica	E.	32 20 38	3007	30 50 34	3014	29 20 39	3021	27 50 52	3028
	Antares	E.	77 59 43	3040	76 30 20	3047	75 1 6	3056	73 32 2	3062
13	Sun	W.	99 44 7	3425	101 5 55	3430	102 27 38	3433	103 49 17	3436
	Pollux	W.	70 48 17	3152	72 15 24	3154	73 42 28	3157	75 9 29	3158
	Regulus	W.	33 48 56	3114	35 16 49	3114	36 44 42	3113	38 12 36	3112
	Antares	E.	66 8 40	3091	64 40 20	3096	63 12 6	3101	61 13 58	3105
14	Sun	W.	110 36 51	3445	111 58 17	3445	113 19 43	3445	114 41 9	3445
	Pollux	W.	82 24 17	3160	83 51 14	3160	85 18 11	3159	86 45 9	3158
	Regulus	W.	45 32 21	3108	47 0 21	3105	48 28 24	3103	49 56 30	3100

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Aquilæ	W.	86° 11′ 24″	2533	87° 51′ 52″	2527	89° 32′ 27″	2523	91° 13′ 8″	2521
	Fomalhaut	W.	57 35 0	2801	59 9 26	2772	60 44 31	2745	62 20 11	2721
	Sun	E.	44 35 29	2436	42 52 46	2432	41 9 57	2429	39 27 4	2426
2	α Aquilæ	W.	99 36 52	2526	101 17 29	2532	102 57 58	2538	104 38 18	2546
	Fomalhaut	W.	70 25 26	2636	72 3 32	2625	73 41 53	2615	75 20 27	2607
	Sun	E.	30 52 4	2425	29 9 5	2427	27 26 9	2430	25 43 17	2435
6	Sun	W.	23 29 11	2719	25 5 26	2731	26 41 24	2746	28 17 3	2761
	Regulus	E.	49 26 27	2412	47 43 9	2429	46 0 16	2447	44 17 48	2466
	Spica	E.	103 2 50	2377	101 18 42	2393	99 34 57	2409	97 51 35	2424
7	Sun	W.	36 10 13	2641	37 43 47	2659	39 16 59	2676	40 49 49	2593
	Regulus	E.	35 52 14	2566	34 12 32	2588	32 33 21	2612	30 54 42	2635
	Spica	E.	89 20 26	2507	87 39 22	2524	85 58 42	2540	84 18 25	2557
8	Sun	W.	48 28 24	2981	49 59 0	2999	51 29 14	3017	52 59 6	3034
	Jupiter	W.	29 15 6	2766	30 50 19	2778	32 25 16	2791	33 59 56	2804
	Regulus	E.	22 50 14	2783	21 15 24	2821	19 41 24	2866	18 8 22	2920
	Spica	E.	76 2 48	2642	74 24 50	2658	72 47 14	2675	71 10 0	2691
9	Sun	W.	60 23 11	3118	61 50 59	3134	63 18 27	3150	64 45 36	3166
	Jupiter	W.	41 48 49	2874	43 21 41	2887	44 54 16	2901	46 26 33	2915
	Pollux	W.	29 46 56	3139	31 14 18	3122	32 42 1	3109	34 9 59	3100
	Spica	E.	63 9 13	2770	61 34 6	2785	59 59 19	2800	58 24 51	2814
	Antares	E.	108 34 27	2805	107 0 6	2820	105 26 4	2834	103 52 20	2848
10	Sun	W.	71 56 47	3239	73 22 10	3253	74 47 16	3266	76 12 7	3278
	Jupiter	W.	54 3 45	2980	55 34 23	2992	57 4 46	3004	58 34 54	3016
	Pollux	W.	41 31 45	3086	43 0 12	3087	44 28 38	3088	45 57 2	3091
	Spica	E.	50 37 8	2883	49 4 28	2895	47 32 3	2907	45 59 53	2919
	Antares	E.	96 8 9	2915	94 36 9	2927	93 4 24	2939	91 32 55	2951
11	Sun	W.	83 12 51	3336	84 36 21	3346	85 59 39	3356	87 22 46	3365
	Jupiter	W.	66 2 8	3067	67 30 58	3077	68 59 36	3085	70 28 4	3093
	Pollux	W.	53 18 1	3109	54 45 59	3114	56 13 51	3119	57 41 38	3123
	Spica	E.	38 22 40	2973	36 51 53	2981	35 21 17	2990	33 50 52	2999
	Antares	E.	83 59 3	3005	82 28 56	3013	80 59 0	3023	79 29 16	3032
12	Sun	W.	94 15 56	3404	95 38 8	3409	97 0 14	3415	98 22 13	3420
	Pollux	W.	64 59 22	3142	66 26 41	3145	67 53 56	3148	69 21 8	3150
	Regulus	W.	27 57 37	3119	29 25 24	3117	30 53 13	3115	32 21 4	3114
	Spica	E.	26 21 14	3034	24 51 43	3040	23 22 20	3045	21 53 3	3049
	Antares	E.	72 3 6	3069	70 34 19	3075	69 5 39	3081	67 37 6	3087
13	Sun	W.	105 10 53	3438	106 32 26	3441	107 53 56	3443	109 15 24	3444
	Pollux	W.	76 36 28	3159	78 3 26	3160	79 30 23	3160	80 57 20	3160
	Regulus	W.	39 40 31	3111	41 8 27	3110	42 36 24	3109	44 4 22	3109
	Antares	E.	60 15 54	3109	58 47 55	3111	57 19 59	3114	55 52 7	3116
14	Sun	W.	116 2 35	3443	117 24 3	3442	118 45 32	3440	120 7 3	3438
	Pollux	W.	88 12 8	3157	89 39 9	3154	91 6 13	3152	92 33 19	3151
	Regulus	W.	51 24 39	3098	52 52 51	3096	54 21 6	3092	55 49 25	3088

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	Antares E.	54° 24′ 17″	3119	52° 56′ 30″	3121	51° 28′ 46″	3123	50° 1′ 4″	3124
	α Aquilæ E.	105 29 24	3500	104 9 0	3495	102 48 30	3489	101 27 54	3484
15	Sun W.	121 28 37	3435	122 50 14	3431	124 11 55	3428	125 33 40	3424
	Pollux W.	94 0 27	3148	95 27 38	3145	96 54 53	3142	98 22 12	3138
	Regulus W.	57 17 49	3085	58 46 17	3081	60 14 50	3076	61 43 29	3072
	Antares E.	42 42 59	3130	41 15 26	3131	39 47 54	3132	38 20 23	3133
	α Aquilæ E.	94 43 29	3460	93 22 20	3455	92 1 6	3451	90 39 47	3447
16	Sun W.	132 23 36	3400	133 45 52	3394	135 8 15	3388	136 30 45	3382
	Pollux W.	105 39 53	3119	107 7 40	3114	108 35 33	3109	110 3 31	3105
	Regulus W.	69 8 16	3043	70 37 35	3037	72 7 2	3030	73 36 37	3023
	Spica W.	15 13 12	3023	16 42 56	3017	18 12 48	3010	19 42 48	3003
	Antares E.	31 3 28	3149	29 36 18	3156	28 9 16	3163	26 42 23	3173
	α Aquilæ E.	83 52 5	3428	82 30 20	3425	81 8 32	3422	79 46 40	3419
17	Regulus W.	81 6 50	2985	82 37 22	2977	84 8 4	2968	85 38 57	2959
	Spica W.	27 15 3	2965	28 45 59	2957	30 17 5	2949	31 48 22	2941
	α Aquilæ E.	72 56 42	3411	71 34 38	3410	70 12 33	3411	68 50 29	3413
	Fomalhaut E.	102 18 14	3447	100 56 51	3434	99 35 13	3421	98 13 20	3408
18	Regulus W.	93 16 10	2913	94 48 12	2905	96 20 25	2895	97 52 50	2885
	Spica W.	39 27 33	2895	40 59 58	2885	42 32 36	2876	44 5 26	2866
	α Aquilæ E.	62 0 49	3430	60 39 7	3438	59 17 34	3446	57 56 10	3457
	Fomalhaut E.	91 20 37	3354	89 57 28	3344	88 34 8	3336	87 10 38	3327
	α Pegasi E.	108 30 31	3073	107 1 49	3060	105 32 51	3048	104 3 38	3036
19	Regulus W.	105 38 4	2836	107 11 45	2827	108 45 38	2817	110 19 44	2808
	Spica W.	51 52 47	2816	53 26 54	2806	55 1 14	2795	56 35 48	2785
	α Aquilæ E.	51 12 43	3538	49 53 1	3563	48 33 46	3590	47 15 1	3622
	Fomalhaut E.	80 10 51	3293	78 46 31	3288	77 22 5	3283	75 57 34	3280
	α Pegasi E.	96 33 54	2978	95 3 14	2968	93 32 21	2957	92 1 14	2947
20	Spica W.	64 31 56	2734	66 7 50	2725	67 43 57	2714	69 20 18	2704
	Antares W.	20 8 29	2999	21 38 43	2954	23 9 54	2915	24 41 54	2883
	Fomalhaut E.	68 54 18	3276	67 29 39	3279	66 5 3	3282	64 40 31	3288
	α Pegasi E.	84 22 32	2698	82 50 11	2689	81 17 38	2680	79 44 54	2673
21	Spica W.	77 25 20	2655	79 3 0	2646	80 40 53	2636	82 18 59	2627
	Antares W.	32 31 0	2763	34 6 17	2744	35 41 58	2726	37 18 1	2711
	Fomalhaut E.	57 40 2	3340	56 16 37	3357	54 53 31	3377	53 30 48	3400
	α Pegasi E.	71 58 47	2637	70 25 7	2631	68 51 19	2625	67 17 24	2621
	α Arietis E.	115 14 21	2728	113 38 19	2717	112 2 2	2706	110 25 30	2695
22	Spica W.	90 32 37	2581	92 11 58	2572	93 51 31	2564	95 31 16	2556
	Antares W.	45 23 17	2643	47 1 14	2631	48 39 27	2620	50 17 55	2608
	Fomalhaut E.	46 44 59	3571	45 25 53	3622	44 7 42	3678	42 50 32	3742
	α Pegasi E.	59 26 33	2607	57 52 14	2606	56 17 54	2607	54 43 35	2608
	α Arietis E.	102 19 19	2644	100 41 24	2635	99 3 17	2626	97 24 57	2616
	Mars E.	114 30 41	2824	112 56 44	2814	111 22 35	2805	109 48 14	2796
23	Antares W.	58 33 59	2557	60 13 53	2548	61 54 0	2539	63 34 19	2530
	Fomalhaut E.	36 44 33	4226	35 36 31	4368	34 30 41	4533	33 27 18	4723

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVIh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	Antares	E.	48° 33′ 24″	3196	47° 5′ 46″	3197	45° 38′ 9″	3198	44° 10′ 33″	3199
	α Aquilæ	E.	100 7 12	3479	98 46 24	3474	97 25 31	3470	96 4 33	3464
15	Sun	W.	126 55 29	3420	128 17 23	3415	129 39 22	3411	131 1 26	3406
	Pollux	W.	99 49 35	3135	101 17 2	3131	102 44 34	3127	104 12 11	3123
	Regulus	W.	63 12 13	3067	64 41 3	3061	66 10 0	3056	67 39 4	3049
	Antares	E.	36 52 54	3136	35 25 28	3138	33 58 4	3141	32 30 44	3144
	α Aquilæ	E.	89 18 24	3443	87 56 56	3438	86 35 23	3435	85 13 46	3431
16	Sun	W.	137 53 22	3376	139 16 6	3370	140 38 57	3363	142 1 56	3356
	Pollux	W.	111 31 35	3100	112 59 45	3095	114 28 1	3090	115 56 23	3086
	Regulus	W.	75 6 21	3016	76 36 14	3009	78 6 16	3001	79 36 28	2993
	Spica	W.	21 12 57	2997	22 43 14	2989	24 13 41	2981	25 44 17	2973
	Antares	E.	25 15 42	3186	23 49 16	3203	22 23 11	3226	20 57 33	3255
	α Aquilæ	E.	78 24 45	3416	77 2 47	3415	75 40 47	3413	74 18 45	3412
17	Regulus	W.	87 10 1	2950	88 41 16	2942	90 12 42	2932	91 44 20	2923
	Spica	W.	33 19 49	2931	34 51 28	2923	36 23 18	2913	37 55 20	2905
	α Aquilæ	E.	67 28 27	3415	66 6 27	3417	64 44 30	3421	63 22 37	3425
	Fomalhaut	E.	96 51 13	3397	95 28 53	3386	94 6 20	3375	92 43 35	3364
18	Regulus	W.	99 25 28	2676	100 58 18	2666	102 31 21	2656	104 4 36	2646
	Spica	W.	45 38 29	2656	47 11 44	2646	48 45 12	2636	50 18 53	2626
	α Aquilæ	E.	56 34 58	3469	55 13 59	3482	53 53 15	3498	52 32 49	3516
	Fomalhaut	E.	85 46 58	3319	84 23 9	3312	82 59 11	3305	81 35 5	3298
	α Pegasi	E.	102 34 10	3025	101 4 28	3013	99 34 31	3001	98 4 20	2989
19	Regulus	W.	111 54 2	2798	113 28 33	2788	115 3 17	2778	116 38 14	2769
	Spica	W.	58 10 35	2775	59 45 35	2765	61 20 49	2755	62 56 16	2745
	α Aquilæ	E.	45 56 50	3658	44 39 18	3699	43 22 30	3746	42 6 31	3799
	Fomalhaut	E.	74 32 59	3276	73 8 20	3275	71 43 39	3275	70 18 58	3276
	α Pegasi	E.	90 29 55	2937	88 58 23	2927	87 26 38	2917	85 54 41	2908
20	Spica	W.	70 56 52	2695	72 33 39	2685	74 10 39	2675	75 47 53	2665
	Antares	W.	26 14 35	2653	27 47 54	2628	29 21 46	2604	30 56 9	2582
	Fomalhaut	E.	63 16 5	3294	61 51 47	3303	60 27 39	3313	59 3 43	3326
	α Pegasi	E.	78 12 0	2665	76 38 56	2657	75 5 42	2650	73 32 19	2643
21	Spica	W.	83 57 17	2618	85 35 48	2608	87 14 32	2599	88 53 28	2590
	Antares	W.	38 54 26	2696	40 31 11	2682	42 8 15	2669	43 45 37	2655
	Fomalhaut	E.	52 8 31	3425	50 46 43	3455	49 25 29	3489	48 4 53	3527
	α Pegasi	E.	65 43 23	2816	64 9 16	2813	62 35 5	2810	61 0 50	2808
	α Arietis	E.	108 48 44	2685	107 11 44	2674	105 34 29	2664	103 57 1	2654
22	Spica	W.	97 11 12	2547	98 51 20	2538	100 31 40	2530	102 12 11	2522
	Antares	W.	51 56 39	2597	53 35 38	2587	55 14 51	2577	56 54 18	2566
	Fomalhaut	E.	41 34 29	3815	40 19 42	3898	39 6 20	3992	37 54 33	4102
	α Pegasi	E.	53 9 18	2811	51 35 5	2816	50 0 58	2821	48 26 58	2829
	α Arietis	E.	95 46 24	2607	94 7 39	2599	92 28 43	2591	90 49 36	2583
	Mars	E.	108 13 41	2787	106 38 56	2778	105 4 0	2769	103 28 52	2761
23	Antares	W.	65 14 50	2522	66 55 33	2513	68 36 28	2505	70 17 34	2497
	Fomalhaut	E.	32 26 38	4945	31 28 59	5202	30 34 39	5504	29 43 58	5861

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	α Pegasi	E.	46° 53′ 8″	2838	45° 19′ 30″	2850	43° 46′ 7″	2864	42° 13′ 2″	2880
	α Arietis	E.	89 10 18	2575	87 30 49	2567	85 51 9	2560	84 11 19	2552
	Mars	E.	101 53 33	2753	100 18 3	2744	98 42 21	2735	97 6 28	2728
24	Antares	W.	71 58 52	2489	73 40 21	2482	75 22 0	2474	77 3 50	2466
	α Aquilæ	W.	30 26 16	4666	31 27 44	4446	32 32 24	4254	33 39 59	4087
	α Arietis	E.	75 49 41	2520	74 8 55	2513	72 28 0	2507	70 46 57	2502
	Mars	E.	89 4 27	2688	87 27 31	2681	85 50 26	2674	84 13 11	2666
	Venus	E.	109 21 4	2855	107 47 48	2848	106 14 22	2841	104 40 47	2833
	Sun	E.	132 48 17	2788	131 13 33	2779	129 38 38	2771	128 3 32	2763
25	Antares	W.	85 35 30	2433	87 18 18	2426	89 1 16	2419	90 44 23	2414
	α Aquilæ	W.	39 53 5	3508	41 13 20	3427	42 35 6	3354	43 58 15	3289
	α Arietis	E.	62 19 58	2479	60 38 16	2476	58 56 29	2473	57 14 38	2470
	Mars	E.	76 4 31	2631	74 26 18	2625	72 47 57	2618	71 9 27	2612
	Saturn	E.	90 49 1	2437	89 6 19	2431	87 23 29	2425	85 40 30	2419
	Venus	E.	96 50 29	2798	95 15 58	2791	93 41 18	2784	92 6 29	2777
	Sun	E.	120 5 28	2725	118 29 22	2718	116 53 6	2711	115 16 41	2704
26	Antares	W.	99 22 2	2385	101 5 58	2380	102 50 2	2375	104 34 13	2371
	α Aquilæ	W.	51 10 57	3043	52 40 17	3005	54 10 23	2971	55 41 12	2940
	α Arietis	E.	48 44 38	2465	47 2 35	2465	45 20 33	2467	43 38 33	2470
	Mars	E.	62 54 46	2581	61 15 25	2574	59 35 55	2569	57 56 17	2563
	Saturn	E.	77 3 22	2389	75 19 31	2383	73 35 32	2377	71 51 25	2372
	Venus	E.	84 10 16	2746	82 34 37	2739	80 58 49	2734	79 22 54	2728
	Sun	E.	107 12 21	2672	105 35 3	2666	103 57 37	2660	102 20 3	2654
27	α Aquilæ	W.	63 24 12	2817	64 58 18	2798	66 32 49	2779	68 7 44	2763
	Fomalhaut	W.	37 24 45	3816	38 39 31	3698	39 56 20	3593	41 15 2	3499
	Mars	E.	49 36 11	2536	47 55 48	2530	46 15 17	2525	44 34 39	2521
	Saturn	E.	63 8 54	2346	61 24 2	2341	59 39 2	2336	57 53 55	2331
	Venus	E.	71 21 25	2700	69 44 45	2695	68 7 59	2690	66 31 6	2686
	Sun	E.	94 10 16	2626	92 31 56	2621	90 53 29	2616	89 14 56	2611
28	α Aquilæ	W.	76 7 7	2699	77 43 48	2690	79 20 41	2682	80 57 45	2674
	Fomalhaut	W.	48 11 27	3157	49 38 27	3109	51 6 26	3064	52 35 20	3022
	α Pegasi	W.	28 46 53	3040	30 16 16	2958	31 47 21	2889	33 19 54	2830
	Mars	E.	36 9 53	2499	34 28 38	2494	32 47 17	2490	31 5 50	2487
	Saturn	E.	49 6 42	2310	47 20 57	2306	45 35 7	2302	43 49 11	2299
	Venus	E.	58 25 9	2663	56 47 40	2660	55 10 6	2656	53 32 27	2652
	Sun	E.	81 0 33	2590	79 21 24	2585	77 42 9	2581	76 2 48	2577
29	α Aquilæ	W.	89 5 16	2650	90 43 3	2649	92 20 52	2647	93 58 43	2648
	Fomalhaut	W.	60 11 6	2869	61 44 5	2846	63 17 33	2825	64 51 28	2807
	α Pegasi	W.	41 19 1	2628	42 57 18	2601	44 36 11	2577	46 15 37	2556
	Saturn	E.	34 58 19	2285	33 11 57	2282	31 25 31	2280	29 39 2	2278
	Venus	E.	45 23 7	2639	43 45 5	2637	42 7 0	2635	40 28 53	2634
	Sun	E.	67 44 59	2564	66 5 15	2562	64 25 28	2561	62 45 39	2558
30	Fomalhaut	W.	72 46 23	2739	74 22 11	2730	75 58 11	2722	77 34 21	2716
	α Pegasi	W.	54 39 5	2482	56 20 44	2471	58 2 38	2462	59 44 44	2455
	Venus	E.	32 18 2	2634	30 39 53	2635	29 1 46	2637	27 23 41	2640
	Sun	E.	54 26 11	2557	52 46 17	2558	51 6 24	2559	49 26 32	2561

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	α Pegasi	E.	40° 40′ 18″	2901	39° 8′ 0″	2926	37° 36′ 14″	2954	36° 5′ 4″	2989
	α Arietis	E.	82 31 18	2545	80 51 7	2538	79 10 47	2532	77 30 18	2526
	Mars	E.	95 30 25	2719	93 54 11	2712	92 17 47	2704	90 41 12	2696
24	Antares	W.	78 45 51	2460	80 28 1	2453	82 10 21	2445	83 52 51	2439
	α Aquilæ	W.	34 50 13	3941	36 2 51	3813	37 17 40	3699	38 34 28	3598
	α Arietis	E.	69 5 47	2497	67 24 30	2492	65 43 6	2487	64 1 35	2483
	Mars	E.	82 35 46	2659	80 58 11	2652	79 20 27	2646	77 42 34	2638
	Venus	E.	103 7 2	2826	101 33 8	2818	99 59 4	2811	98 24 51	2804
	Sun	E.	126 28 15	2755	124 52 48	2747	123 17 11	2740	121 41 24	2733
25	Antares	W.	92 27 38	2408	94 11 2	2402	95 54 34	2396	97 38 14	2391
	α Aquilæ	W.	45 22 39	3230	46 48 13	3177	48 14 50	3128	49 42 26	3082
	α Arietis	E.	55 32 43	2468	53 50 45	2466	52 8 44	2465	50 26 41	2465
	Mars	E.	69 30 48	2605	67 52 0	2599	66 13 4	2593	64 33 59	2587
	Saturn	E.	83 57 22	2412	82 14 5	2406	80 30 39	2400	78 47 5	2394
	Venus	E.	90 31 31	2771	88 56 25	2764	87 21 10	2758	85 45 47	2752
	Sun	E.	113 40 6	2698	112 3 23	2691	110 26 31	2684	108 49 30	2678
26	Antares	W.	106 18 30	2366	108 2 54	2361	109 47 25	2357	111 32 2	2353
	α Aquilæ	W.	57 12 40	2911	58 44 45	2885	60 17 23	2860	61 50 33	2838
	α Arietis	E.	41 56 38	2474	40 14 49	2480	38 33 8	2487	36 51 37	2497
	Mars	E.	56 16 31	2557	54 36 37	2552	52 56 36	2546	51 16 27	2541
	Saturn	E.	70 7 10	2366	68 22 47	2362	66 38 17	2356	64 53 39	2351
	Venus	E.	77 46 51	2722	76 10 41	2716	74 34 23	2711	72 57 58	2705
	Sun	E.	100 42 21	2648	99 4 31	2643	97 26 34	2637	95 48 29	2631
27	α Aquilæ	W.	69 43 0	2748	71 18 36	2734	72 54 30	2722	74 30 41	2710
	Fomalhaut	W.	42 35 27	3415	43 57 26	3341	45 20 50	3273	46 45 33	3213
	Mars	E.	42 53 55	2516	41 13 4	2512	39 32 7	2507	37 51 3	2502
	Saturn	E.	56 8 41	2327	54 23 21	2322	52 37 54	2318	50 52 21	2314
	Venus	E.	64 54 7	2681	63 17 2	2676	61 39 50	2672	60 2 32	2668
	Sun	E.	87 36 16	2606	85 57 29	2601	84 18 36	2597	82 39 37	2593
28	α Aquilæ	W.	82 35 0	2667	84 12 24	2662	85 49 55	2657	87 27 33	2653
	Fomalhaut	W.	54 5 5	2985	55 35 36	2953	57 6 48	2922	58 38 39	2894
	α Pegasi	W.	34 53 43	2778	36 28 40	2732	38 4 37	2693	39 41 26	2659
	Mars	E.	29 24 18	2484	27 42 42	2480	26 1 1	2477	24 19 16	2475
	Saturn	E.	42 3 10	2296	40 17 4	2292	38 30 53	2289	36 44 38	2287
	Venus	E.	51 54 43	2649	50 16 55	2646	48 39 2	2643	47 1 6	2641
	Sun	E.	74 23 22	2574	72 43 52	2572	71 4 18	2569	69 24 40	2566
29	α Aquilæ	W.	95 36 33	2649	97 14 22	2650	98 52 9	2653	100 29 52	2657
	Fomalhaut	W.	66 25 47	2790	68 0 28	2775	69 35 29	2761	71 10 48	2749
	α Pegasi	W.	47 55 32	2538	49 35 53	2521	51 16 37	2506	52 57 42	2493
	Saturn	E.	27 52 30	2276	26 5 56	2275	24 19 20	2274	22 32 43	2273
	Venus	E.	38 50 44	2633	37 12 34	2632	35 34 23	2632	33 56 12	2633
	Sun	E.	61 5 47	2558	59 25 54	2557	57 46 0	2556	56 6 5	2557
30	Fomalhaut	W.	79 10 40	2711	80 47 5	2707	82 23 35	2704	84 0 9	2703
	α Pegasi	W.	61 27 0	2448	63 9 26	2442	64 52 0	2438	66 34 40	2435
	Venus	E.	25 45 40	2643	24 7 44	2648	22 29 54	2653	20 52 11	2660
	Sun	E.	47 46 43	2563	46 6 57	2565	44 27 14	2569	42 47 36	2572

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	6 40 17.81	10.345	N.23 7 43.7	− 9.97	15 46.15	68.79	3 29.88	0.486
Mon.	2	6 44 25.98	10.335	23 3 32.4	10.98	15 46.14	68.75	3 41.47	0.476
Tues.	3	6 48 33.90	10.324	22 58 56.9	11.98	15 46.14	68.71	3 52.80	0.466
Wed.	4	6 52 41.52	10.311	22 53 57.4	−12.97	15 46.14	68.67	4 3.83	0.453
Thur.	5	6 56 48.85	10.298	22 48 34.0	13.97	15 46.15	68.63	4 14 58	0.440
Frid.	6	7 0 55.84	10.283	22 42 46.8	14.96	15 46.16	68.58	4 24.98	0.425
Sat.	7	7 5 2.47	10.268	22 36 36.0	−15.94	15 46.17	68.53	4 35.02	0.410
SUN.	8	7 9 8.71	10.252	22 30 1.6	16.91	15 46.20	68.48	4 44.68	0.394
Mon.	9	7 13 14.56	10.235	22 23 4.0	17.88	15 46.23	68.42	4 53.94	0.377
Tues.	10	7 17 19.99	10.217	22 15 43.2	−18.85	15 46.27	68 36	5 2.78	0.359
Wed.	11	7 21 24.96	10.198	22 7 59.3	19.80	15 46.31	68.30	5 11.18	0.340
Thur.	12	7 25 29.46	10.178	21 59 52.8	20.74	15 46.36	68.24	5 19.10	0.320
Frid.	13	7 29 33.49	10.158	21 51 23.7	−21.67	15 46.41	68.17	5 26.55	0.300
Sat.	14	7 33 37.04	10.137	21 42 32.2	22.59	15 46.46	68.10	5 33.52	0.279
SUN.	15	7 37 40.08	10.116	21 33 18.3	23.51	15 46.52	68.03	5 39.99	0.259
Mon.	16	7 41 42.61	10.095	21 23 42.6	−24.42	15 46.58	67.96	5 45.95	0.237
Tues.	17	7 45 44.61	10.073	21 13 45.1	25.32	15 46.64	67.89	5 51.38	0.215
Wed.	18	7 49 46.08	10.050	21 3 25.9	26.22	15 46.70	67.82	5 56.28	0.193
Thur.	19	7 53 47.01	10.027	20 52 45.2	−27.12	15 46.77	67.75	6 0.64	0.170
Frid.	20	7 57 47.39	10.004	20 41 43.5	28.00	15 46.85	67.67	6 4.45	0.147
Sat.	21	8 1 47.21	9.981	20 30 20.9	28.87	15 46.93	67.59	6 7.72	0.124
SUN.	22	8 5 46.49	9.958	20 18 37.6	−29.72	15 47.00	67.51	6 10.43	0.101
Mon.	23	8 9 45.20	9.934	20 6 33.8	30.57	15 47.08	67.43	6 12.58	0.077
Tues.	24	8 13 43.34	9.911	19 54 9.8	31.41	15 47.17	67.35	6 14.17	0.054
Wed.	25	8 17 40.92	9.887	19 41 25.8	−32.25	15 47.26	67.26	6 15.19	0.030
Thur.	26	8 21 37.93	9.864	19 28 22.2	33.06	15 47.35	67.18	6 15.64	0.007
Frid.	27	8 25 34.37	9.840	19 14 59.1	33.86	15 47.45	67.09	6 15.52	0.017
Sat.	28	8 29 30.23	9.816	19 1 16.7	−34.65	15 47.55	67.01	6 14.82	0.041
SUN.	29	8 33 25.49	9.791	18 47 15.4	35.43	15 47.66	66.92	6 13.54	0.066
Mon.	30	8 37 20,16	9.767	18 32 55.5	36.20	15 47.77	66.83	6 11.66	0.090
Tues.	31	8 41 14.24	9.742	18 18 17.5	36.96	15 47.88	66.74	6 9.19	0.115
Wed.	32	8 45 7.73	9.717	N.18 3 21.4	−37.70	15 48.00	66.66	6 6.13	0.140

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.
The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	6 40 17.21	10.344	N. 23 7 44.3	− 9.97	3 29.85	0.486	6 36 47.36
Mon.	2	6 44 25.35	10.333	23 3 33.1	10.98	3 41.43	0.476	6 40 43.92
Tues.	3	6 48 33.24	10.322	22 58 57.7	11.98	3 52.75	0.466	6 44 40.47
Wed.	4	6 52 40.83	10.310	22 53 58.3	− 12.97	4 3.80	0.453	6 48 37.03
Thur.	5	6 56 48.13	10.297	22 48 35.0	13.97	4 14.55	0.440	6 52 33.58
Frid.	6	7 0 55.09	10.283	22 42 47.9	14.96	4 24.95	0.425	6 56 30.14
Sat.	7	7 5 1.69	10.268	22 36 37.1	− 15.94	4 34.99	0.410	7 0 26.70
SUN.	8	7 9 7.90	10.251	22 30 2.9	16.91	4 44.64	0.394	7 4 23.26
Mon.	9	7 13 13.72	10.234	22 23 5.4	17.88	4 53.91	0.377	7 8 19.81
Tues.	10	7 17 19.12	10.216	22 15 44.7	− 18.85	5 2.75	0.359	7 12 16.37
Wed.	11	7 21 24.07	10.197	22 8 1.0	19.80	5 11.15	0.340	7 16 12.92
Thur.	12	7 25 28.55	10.177	21 59 54.6	20.74	5 19.07	0.320	7 20 9.48
Frid.	13	7 29 32.56	10.157	21 51 25.6	− 21.67	5 26.52	0.300	7 24 6.04
Sat.	14	7 33 36.09	10.136	21 42 34.2	22.59	5 33.49	0.279	7 28 2.60
SUN.	15	7 37 39.12	10.116	21 33 20.5	23.51	5 39.97	0.259	7 31 59.15
Mon.	16	7 41 41.63	10.094	21 23 44.9	− 24.42	5 45.92	0.237	7 35 55.71
Tues.	17	7 45 43.62	10.072	21 13 47.5	25.32	5 51.36	0.215	7 39 52.26
Wed.	18	7 49 45.08	10.050	21 3 28.4	26.22	5 56.26	0.193	7 43 48.82
Thur.	19	7 53 46.00	10.027	20 52 47.9	− 27.12	6 0.63	0.170	7 47 45.37
Frid.	20	7 57 46.37	10.004	20 41 46.3	28.00	6 4.44	0.147	7 51 41.93
Sat.	21	8 1 46.19	9.981	20 30 23.8	28.87	6 7.71	0.124	7 55 38.48
SUN.	22	8 5 45.46	9.958	20 18 40.6	− 29.72	6 10.42	0.101	7 59 35.04
Mon.	23	8 9 44.17	9.934	20 6 36.9	30.57	6 12.57	0.077	8 3 31.60
Tues.	24	8 13 42.31	9.911	19 54 13.0	31.41	6 14.15	0.054	8 7 28.16
Wed.	25	8 17 39.89	9.887	19 41 29.1	− 32.25	6 15.18	0.030	8 11 24.71
Thur.	26	8 21 36.90	9.864	19 28 25.6	33.06	6 15.63	0.007	8 15 21.27
Frid.	27	8 25 33.34	9.840	19 15 2.6	33.86	6 15.52	0.017	8 19 17.82
Sat.	28	8 29 29.20	9.816	19 1 20.3	− 34.65	6 14.82	0.041	8 23 14.38
SUN.	29	8 33 24.47	9.791	18 47 19.1	35.44	6 13.54	0.066	8 27 10.93
Mon.	30	8 37 19.15	9.767	18 32 59.3	36.20	6 11.66	0.090	8 31 7.49
Tues.	31	8 41 13.24	9.742	18 18 21.3	36.96	6 9.20	0.115	8 35 4.04
Wed.	32	8 45 6.74	9.717	N. 18 3 25.2	− 37.70	6 6.14	0.140	8 39 0.60

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour, + 9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	182	99 15 37.1	15 0.8	143.04	− 0.22	0.0072141	+ 2.4	17 20 21.73
2	183	100 12 50.2	12 13.7	143.04	0.35	0.0072185	1.3	17 16 25.82
3	184	101 10 3.4	9 26.7	143.05	0.46	0.0072203	+ 0.2	17 12 29.91
4	185	102 7 16.7	6 39.9	143.06	− 0.55	0.0072195	− 0.9	17 8 34.00
5	186	103 4 30.1	3 53.1	143.06	0.61	0.0072161	2.0	17 4 38.09
6	187	104 1 43.6	1 6.4	143.06	0.65	0.0072100	3.1	17 0 42.18
7	188	104 58 57.0	58 19.7	143.06	− 0.65	0.0072014	− 4.2	16 56 46.27
8	189	105 56 10.5	55 33.0	143.06	0.61	0.0071902	5.2	16 52 50.36
9	190	106 53 23.9	52 46.2	143.06	0.55	0.0071765	6.2	16 48 54.45
10	191	107 50 37.3	49 59.5	143.06	− 0.46	0.0071604	− 7.2	16 44 58.54
11	192	108 47 50.7	47 12.8	143.06	0.37	0.0071421	8.1	16 41 2.63
12	193	109 45 4.1	44 26.0	143.06	0.25	0.0071215	9.0	16 37 6.72
13	194	110 42 17.5	41 39.2	143.06	− 0.12	0.0070989	− 9.8	16 33 10.81
14	195	111 39 31.0	38 52.5	143.06	0.00	0.0070745	10.6	16 29 14.90
15	196	112 36 44.6	36 5.9	143.07	+ 0.12	0.0070485	11.3	16 25 18.99
16	197	113 33 58.3	33 19.4	143.08	+ 0.25	0.0070207	− 11.9	16 21 23.08
17	198	114 31 12.2	30 33.2	143.10	0.35	0.0069914	12.5	16 17 27.17
18	199	115 28 26.4	27 47.3	143.11	0.41	0.0069607	13.1	16 13 31.26
19	200	116 25 41.1	25 1.9	143.13	+ 0.45	0.0069285	− 13.7	16 9 35.34
20	201	117 22 56.3	22 16.9	143.15	0.46	0.0068950	14.3	16 5 39.43
21	202	118 20 12.1	19 32.5	143.17	0.43	0.0068601	14.8	16 1 43.52
22	203	119 17 28.5	16 48.8	143.20	+ 0.38	0.0068238	− 15.4	15 57 47.61
23	204	120 14 45.7	14 5.9	143.23	0.30	0.0067861	16.0	15 53 51.70
24	205	121 12 3.8	11 23.9	143.27	0.20	0.0067469	16.6	15 49 55.79
25	206	122 9 22.8	8 42.7	143.31	+ 0.08	0.0067061	− 17.3	15 45 59.88
26	207	123 6 42.7	6 2.4	143.35	− 0.05	0.0066636	18.1	15 42 3.97
27	208	124 4 3.6	3 23.2	143.39	0.19	0.0066192	18.9	15 38 8.06
28	209	125 1 25.5	0 45.0	143.43	− 0.32	0.0065728	− 19.7	15 34 12.15
29	210	125 58 48.5	58 7.9	143.48	0.45	0.0065243	20.6	15 30 16.25
30	211	126 56 12.6	55 31.8	143.52	0.56	0.0064738	21.5	15 26 20.34
31	212	127 53 37.8	52 56.8	143.56	0.66	0 0064210	22.5	15 22 24.43
32	213	128 51 4.0	50 22.8	143.60	− 0.72	0.0063659	− 23.5	15 18 28.52

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 14.0	16 12.3	59 27.8	− 0.42	59 21.7	− 0.60	21 59.7	2.44	26.2
2	16 10.0	16 7.1	59 13.4	0.79	59 2.7	0.98	22 58.2	2.42	27.2
3	16 3.6	15 59.6	58 49.9	1.16	58 34.9	1.32	23 55.3	2.33	28.2
4	15 55.0	15 50.0	58 18.2	− 1.46	57 59.8	− 1.58	δ		29.2
5	15 44.7	15 39.1	57 40.3	1.67	57 19.8	1.72	0 50.0	2.21	0.9
6	15 33.4	15 27.7	56 58.9	1.74	56 37.9	1.73	1 41.5	2.08	1.9
7	15 22.1	15 16.6	56 17.2	− 1.69	55 57.2	− 1.62	2 30.0	1.96	2.9
8	15 11.5	15 6.7	55 38.3	1.52	55 20.7	1.40	3 15.9	1.87	3.9
9	15 2.4	14 58.6	55 4.8	1.24	54 50.9	1.07	3 59.8	1.80	4.9
10	14 55.3	14 52.8	54 39.0	− 0.89	54 29.5	− 0.69	4 42.7	1.77	5.9
11	14 50.8	14 49.6	54 22.4	0.48	54 17.8	− 0.27	5 25.3	1.78	6.9
12	14 49.0	14 49.2	54 15.8	− 0.06	54 16.4	+ 0.15	6 8.4	1.82	7.9
13	14 50.0	14 51.6	54 19.5	+ 0.36	54 25.1	+ 0.57	6 52.6	1.88	8.9
14	14 53.7	14 56.5	54 33.1	0.76	54 43.4	0.94	7 38.5	1.96	9.9
15	14 59.9	15 3.8	54 55.8	1.11	55 10.1	1.26	8 26.5	2.05	10.9
16	15 8.1	15 12.8	55 25.9	+ 1.37	55 43.2	+ 1.48	9 16.6	2.13	11.9
17	15 17.8	15 23.0	56 1.6	1.56	56 20.7	1.61	10 8.4	2.19	12.9
18	15 28.3	15 33.6	56 40.2	1.62	56 59.7	1.62	11 1.2	2.21	13.9
19	15 38.9	15 44.0	57 19.0	+ 1.58	57 37.6	+ 1.51	11 54.4	2.21	14.9
20	15 48.8	15 53.2	57 55.3	1.41	58 11.7	1.31	12 47.3	2.19	15.9
21	15 57.3	16 1.0	58 26.7	1.18	58 40.1	1.04	13 39.5	2.16	16.9
22	16 4.1	16 6.8	58 51.7	+ 0.88	59 1.3	+ 0.72	14 31.0	2.16	17.9
23	16 8.9	16 10.5	59 9.2	0.57	59 15.1	0.43	15 22.3	2.14	18.9
24	16 11.7	16 12.3	59 19.3	0.27	59 21.7	+ 0.13	16 13.9	2.17	19.9
25	16 12.5	16 12.3	59 22.5	+ 0.01	59 21.8	− 0.12	17 6.4	2.21	20.9
26	16 11.8	16 10.9	59 19.7	− 0.22	59 16.4	0.32	18 0.3	2.28	21.9
27	16 9.6	16 8.1	59 11.9	0.42	59 6.2	0.52	18 55.6	2.34	22.9
28	16 6.2	16 4.1	58 59.4	− 0.61	58 51.6	− 0.69	19 52.2	2.37	23.9
29	16 1.7	15 59.0	58 42.7	0.78	58 32.8	0.87	20 49.2	2.37	24.9
30	15 56.0	15 52.7	58 21.8	0.96	58 9.7	1.04	21 45.6	2.32	25.9
31	15 49.2	15 45.4	57 56.7	1.12	57 42.8	1.19	22 40.2	2.23	26.9
32	15 41.4	15 37.1	57 28.0	− 1.27	57 12.4	− 1.32	23 32.4	2.12	27.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 45 5.11	2.4877	N.18 10 54.6	4.943
1	3 47 34.43	2.4895	18 15 47.6	4.821
2	3 50 3.85	2.4913	18 20 33.2	4.699
3	3 52 33.38	2.4931	18 25 11.5	4.577
4	3 55 3.02	2.4948	18 29 42.5	4.455
5	3 57 32.76	2.4964	18 34 6.1	4.331
6	4 0 2.59	2.4980	18 38 22.2	4.207
7	4 2 32.52	2.4995	18 42 30.9	4.082
8	4 5 2.53	2.5009	18 46 32.1	3.957
9	4 7 32.62	2.5022	18 50 25.8	3.832
10	4 10 2.79	2.5035	18 54 11.9	3.705
11	4 12 33.04	2.5047	18 57 50.4	3.579
12	4 15 3.35	2.5057	19 1 21.4	3.452
13	4 17 33.72	2.5067	19 4 44.7	3.324
14	4 20 4.15	2.5077	19 8 0.3	3.197
15	4 22 34.64	2.5085	19 11 8.3	3.069
16	4 25 5.17	2.5093	19 14 8.6	2.940
17	4 27 35.75	2.5100	19 17 1.1	2.811
18	4 30 6.37	2.5106	19 19 45.9	2.682
19	4 32 37.02	2.5110	19 22 22.9	2.552
20	4 35 7.69	2.5114	19 24 52.1	2.423
21	4 37 38.39	2.5118	19 27 13.6	2.293
22	4 40 9.11	2.5121	19 29 27.3	2.162
23	4 42 39.84	2.5122	N.19 31 33.1	2.031

MONDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 45 10.57	2.5122	N.19 33 31.0	1.900
1	4 47 41.30	2.5122	19 35 21.1	1.770
2	4 50 12.03	2.5121	19 37 3.4	1.640
3	4 52 42.75	2.5119	19 38 37.9	1.509
4	4 55 13.46	2.5116	19 40 4.5	1.377
5	4 57 44.14	2.5111	19 41 23.2	1.246
6	5 0 14.79	2.5106	19 42 34.0	1.115
7	5 2 45.41	2.5101	19 43 37.0	0.984
8	5 5 16.00	2.5094	19 44 32.1	0.853
9	5 7 46.54	2.5086	19 45 19.3	0.722
10	5 10 17.03	2.5077	19 45 58.7	0.591
11	5 12 47.47	2.5068	19 46 30.2	0.460
12	5 15 17.85	2.5057	19 46 53.9	0.329
13	5 17 48.16	2.5046	19 47 9.7	0.198
14	5 20 18.40	2.5034	19 47 17.7	+ 0.068
15	5 22 48.57	2.5021	19 47 17.9	− 0.062
16	5 25 18.65	2.5006	19 47 10.3	0.192
17	5 27 48.64	2.4991	19 46 54.9	0.322
18	5 30 18.54	2.4975	19 46 31.7	0.452
19	5 32 48.34	2.4958	19 46 0.7	0.581
20	5 35 18.04	2.4941	19 45 22.0	0.709
21	5 37 47.63	2.4922	19 44 35.6	0.837
22	5 40 17.11	2.4902	19 43 41.5	0.966
23	5 42 46.46	2.4881	19 42 39.7	1.094
24	5 45 15.68	2.4859	N.19 41 30.2	1.222

TUESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 45 15.68	2.4859	N.19 41 30.2	1.222
1	5 47 44.77	2.4837	19 40 13.1	1.348
2	5 50 13.73	2.4815	19 38 48.4	1.475
3	5 52 42.55	2.4791	19 37 16.1	1.601
4	5 55 11.22	2.4766	19 35 36.3	1.726
5	5 57 39.74	2.4740	19 33 49.0	1.852
6	6 0 8.10	2.4713	19 31 54.1	1.977
7	6 2 36.30	2.4686	19 29 51.8	2.100
8	6 5 4.33	2.4658	19 27 42.1	2.222
9	6 7 32.20	2.4630	19 25 25.1	2.345
10	6 9 59.89	2.4600	19 23 0.7	2.468
11	6 12 27.40	2.4570	19 20 29.0	2.590
12	6 14 54.73	2.4539	19 17 49.9	2.712
13	6 17 21.87	2.4507	19 15 3.6	2.831
14	6 19 48.81	2.4474	19 12 10.2	2.950
15	6 22 15.56	2.4441	19 9 9.6	3.069
16	6 24 42.11	2.4407	19 6 1.9	3.187
17	6 27 8.45	2.4372	19 2 47.2	3.304
18	6 29 34.57	2.4336	18 59 25.4	3.421
19	6 32 0.48	2.4300	18 55 56.6	3.537
20	6 34 26.17	2.4264	18 52 20.9	3.652
21	6 36 51.65	2.4227	18 48 38.4	3.766
22	6 39 16.90	2.4189	18 44 49.0	3.879
23	6 41 41.92	2.4150	N.18 40 52.9	3.992

WEDNESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 44 6.70	2.4111	N.18 36 50.0	4.103
1	6 46 31.25	2.4071	18 32 40.5	4.214
2	6 48 55.55	2.4030	18 28 24.3	4.325
3	6 51 19.61	2.3989	18 24 1.5	4.434
4	6 53 43.42	2.3948	18 19 32.2	4.542
5	6 56 6.98	2.3906	18 14 56.5	4.649
6	6 58 30.29	2.3863	18 10 14.3	4.756
7	7 0 53.34	2.3820	18 5 25.8	4.861
8	7 3 16.13	2.3777	18 0 31.0	4.965
9	7 5 38.67	2.3734	17 55 30.0	5.068
10	7 8 0.94	2.3689	17 50 22.8	5.171
11	7 10 22.94	2.3645	17 45 9.5	5.272
12	7 12 44.68	2.3601	17 39 50.1	5.373
13	7 15 6.15	2.3555	17 34 24.7	5.472
14	7 17 27.34	2.3509	17 28 53.4	5.571
15	7 19 48.25	2.3463	17 23 16.2	5.669
16	7 22 8.89	2.3417	17 17 33.1	5.766
17	7 24 29.25	2.3369	17 11 44.3	5.861
18	7 26 49.32	2.3322	17 5 49.8	5.956
19	7 29 9.11	2.3275	16 59 49.6	6.049
20	7 31 28.62	2.3227	16 53 43.9	6.141
21	7 33 47.84	2.3179	16 47 32.7	6.232
22	7 36 6.77	2.3131	16 41 16.0	6.322
23	7 38 25.41	2.3083	16 34 54.0	6.411
24	7 40 43.77	2.3036	N.16 28 26.7	6.499

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 40 43.77	2.3036	N.16 28 26.7	6.499
1	7 43 1.84	2.2987	16 21 54.1	6.587
2	7 45 19.61	2.2937	16 15 16.3	6.673
3	7 47 37.08	2.2887	16 8 33.4	6.758
4	7 49 54.26	2.2838	16 1 45.4	6.842
5	7 52 11.14	2.2789	15 54 52.4	6.924
6	7 54 27.73	2.2740	15 47 54.5	7.006
7	7 56 44.02	2.2690	15 40 51.7	7.087
8	7 59 0.01	2.2641	15 33 44.1	7.166
9	8 1 15.71	2.2592	15 26 31.8	7.244
10	8 3 31.11	2.2542	15 19 14.8	7.322
11	8 5 46.21	2.2492	15 11 53.2	7.398
12	8 8 1.02	2.2442	15 4 27.0	7.473
13	8 10 15.52	2.2392	14 56 56.4	7.547
14	8 12 29.73	2.2343	14 49 21.4	7.620
15	8 14 43.64	2.2293	14 41 42.0	7.692
16	8 16 57.25	2.2243	14 33 58.3	7.763
17	8 19 10.56	2.2193	14 26 10.4	7.832
18	8 21 23.57	2.2144	14 18 18.4	7.901
19	8 23 36.29	2.2095	14 10 22.3	7.968
20	8 25 48.71	2.2045	14 2 22.2	8.035
21	8 28 0.83	2.1995	13 54 18.1	8.101
22	8 30 12.65	2.1946	13 46 10.1	8.165
23	8 32 24.18	2.1897	N.13 37 58.3	8.227

FRIDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 34 35.42	2.1849	N.13 29 42.8	8.289
1	8 36 46.37	2.1800	13 21 23.6	8.351
2	8 38 57.02	2.1751	13 13 0.7	8.411
3	8 41 7.38	2.1702	13 4 34.3	8.469
4	8 43 17.45	2.1654	12 56 4.4	8.527
5	8 45 27.23	2.1607	12 47 31.0	8.585
6	8 47 36.73	2.1559	12 38 54.2	8.641
7	8 49 45.94	2.1511	12 30 14.1	8.695
8	8 51 54.86	2.1463	12 21 30.8	8.748
9	8 54 3.50	2.1416	12 12 44.3	8.801
10	8 56 11.86	2.1370	12 3 54.7	8.852
11	8 58 19.94	2.1323	11 55 2.0	8.903
12	9 0 27.74	2.1277	11 46 6.3	8.952
13	9 2 35.26	2.1231	11 37 7.7	9.001
14	9 4 42.51	2.1185	11 28 6.2	9.049
15	9 6 49.48	2.1139	11 19 1.8	9.096
16	9 8 56.18	2.1094	11 9 54.7	9.141
17	9 11 2.61	2.1049	11 0 44.9	9.186
18	9 13 8.77	2.1005	10 51 32.4	9.230
19	9 15 14.67	2.0961	10 42 17.3	9.272
20	9 17 20.30	2.0916	10 32 59.8	9.313
21	9 19 25.66	2.0872	10 23 39.8	9.353
22	9 21 30.76	2.0829	10 14 17.4	9.393
23	9 23 35.61	2.0787	10 4 52.6	9.432
24	9 25 40.20	2.0744	N. 9 55 25.5	9.470

SATURDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 25 40.20	2.0744	N. 9 55 25.5	9.470
1	9 27 44.54	2.0702	9 45 56.2	9.507
2	9 29 48.63	2.0660	9 36 24.7	9.543
3	9 31 52.46	2.0618	9 26 51.1	9.578
4	9 33 56.04	2.0577	9 17 15.4	9.612
5	9 35 59.39	2.0537	9 7 37.7	9.644
6	9 38 2.49	2.0497	8 57 58.1	9.676
7	9 40 5.35	2.0457	8 48 16.6	9.707
8	9 42 7.97	2.0417	8 38 33.2	9.738
9	9 44 10.36	2.0378	8 28 48.0	9.768
10	9 46 12.51	2.0340	8 19 1.0	9.797
11	9 48 14.44	2.0302	8 9 12.4	9.824
12	9 50 16.14	2.0265	7 59 22.1	9.851
13	9 52 17.62	2.0227	7 49 30.2	9.877
14	9 54 18.87	2.0190	7 39 36.8	9.902
15	9 56 19.90	2.0153	7 29 42.0	9.926
16	9 58 20.71	2.0117	7 19 45.7	9.949
17	10 0 21.31	2.0082	7 9 48.1	9.972
18	10 2 21.70	2.0047	6 59 49.1	9.994
19	10 4 21.88	2.0013	6 49 48.8	10.015
20	10 6 21.86	1.9979	6 39 47.3	10.034
21	10 8 21.63	1.9945	6 29 44.7	10.053
22	10 10 21.20	1.9912	6 19 40.9	10.072
23	10 12 20.57	1.9879	N. 6 9 36.0	10.091

SUNDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 14 19.75	1.9847	N. 5 59 30.0	10.107
1	10 16 18.74	1.9816	5 49 23.1	10.123
2	10 18 17.54	1.9784	5 39 15.2	10.139
3	10 20 16.15	1.9753	5 29 6.4	10.153
4	10 22 14.58	1.9723	5 18 56.8	10.167
5	10 24 12.83	1.9694	5 8 46.4	10.179
6	10 26 10.91	1.9665	4 58 35.3	10.191
7	10 28 8.81	1.9636	4 48 23.5	10.202
8	10 30 6.54	1.9608	4 38 11.0	10.214
9	10 32 4.11	1.9581	4 27 57.8	10.225
10	10 34 1.51	1.9553	4 17 44.0	10.234
11	10 35 58.75	1.9527	4 7 29.7	10.242
12	10 37 55.83	1.9501	3 57 15.0	10.249
13	10 39 52.76	1.9475	3 46 59.8	10.257
14	10 41 49.53	1.9449	3 36 44.2	10.263
15	10 43 46.15	1.9425	3 26 28.2	10.269
16	10 45 42.63	1.9401	3 16 11.9	10.274
17	10 47 38.96	1.9377	3 5 55.3	10.278
18	10 49 35.15	1.9354	2 55 38.5	10.282
19	10 51 31.21	1.9332	2 45 21.5	10 284
20	10 53 27.13	1.9309	2 35 4.4	10.287
21	10 55 22.92	1.9287	2 24 47.1	10.289
22	10 57 18.58	1.9267	2 14 29.7	10.290
23	10 59 14.12	1.9247	2 4 12.3	10.290
24	11 1 9.54	1.9227	N. 1 53 54.9	10.289

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 1 9.54	1.9227	N. 1 53 54.9	10.289
1	11 3 4.84	1.9207	1 43 37.6	10.288
2	11 5 0.03	1.9188	1 33 20.3	10.287
3	11 6 55.10	1.9169	1 23 3.1	10.285
4	11 8 50.06	1.9152	1 12 46.1	10.282
5	11 10 44.92	1.9135	1 2 29.3	10.278
6	11 12 39.68	1.9118	0 52 12.7	10.274
7	11 14 34.34	1.9102	0 41 56.4	10.269
8	11 16 28.90	1.9086	0 31 40.4	10.263
9	11 18 23.37	1.9071	0 21 24.8	10.257
10	11 20 17.75	1.9057	0 11 9.5	10.251
11	11 22 12.05	1.9042	N. 0 0 54.7	10.244
12	11 24 6.26	1.9028	S. 0 9 19.7	10.236
13	11 26 0.39	1.9016	0 19 33.6	10.227
14	11 27 54.45	1.9003	0 29 47.0	10.218
15	11 29 48.43	1.8991	0 39 59.8	10.208
16	11 31 42.34	1.8979	0 50 12.0	10.198
17	11 33 36.18	1.8968	1 0 23.6	10.187
18	11 35 29.96	1.8958	1 10 34.5	10.176
19	11 37 23.68	1.8948	1 20 44.7	10.164
20	11 39 17.34	1.8938	1 30 54.2	10.152
21	11 41 10.94	1.8929	1 41 2.9	10.138
22	11 43 4.49	1.8921	1 51 10.8	10.124
23	11 44 57.99	1.8913	S. 2 1 17.8	10.110

TUESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 46 51.45	1.8907	S. 2 11 24.0	10.096
1	11 48 44.87	1.8900	2 21 29.3	10.080
2	11 50 38.25	1.8893	2 31 33.6	10.064
3	11 52 31.59	1.8887	2 41 37.0	10.048
4	11 54 24.90	1.8882	2 51 39.4	10.031
5	11 56 18.18	1.8877	3 1 40.7	10.013
6	11 58 11.43	1.8873	3 11 40.9	9.995
7	12 0 4.66	1.8870	3 21 40.1	9.977
8	12 1 57.87	1.8867	3 31 38.1	9.957
9	12 3 51.06	1.8864	3 41 34.9	9.937
10	12 5 44.23	1.8862	3 51 30.5	9.917
11	12 7 37.40	1.8861	4 1 24.9	9.896
12	12 9 30.56	1.8860	4 11 18.0	9.874
13	12 11 23.72	1.8859	4 21 9.8	9.853
14	12 13 16.87	1.8858	4 31 0.3	9.831
15	12 15 10.02	1.8859	4 40 49.5	9.808
16	12 17 3.18	1.8860	4 50 37.2	9.784
17	12 18 56 34	1.8861	5 0 23.5	9.760
18	12 20 49.51	1.8863	5 10 8.4	9.736
19	12 22 42.70	1.8866	5 19 51.8	9.710
20	12 24 35.90	1.8868	5 29 33.6	9.684
21	12 26 29.12	1.8872	5 39 13.9	9.658
22	12 28 22.37	1.8877	5 48 52.6	9.632
23	12 30 15.64	1.8881	5 58 29.7	9.605
24	12 32 8.94	1.8886	S. 6 8 5.2	9.577

WEDNESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 32 8.94	1.8886	S. 6 8 5.2	9.577
1	12 34 2.27	1.8892	6 17 39.0	9.549
2	12 35 55.64	1.8898	6 27 11.1	9.520
3	12 37 49.04	1.8904	6 36 41.4	9.491
4	12 39 42.48	1.8911	6 46 10.0	9.462
5	12 41 35.97	1.8918	6 55 36.8	9.431
6	12 43 29.50	1.8926	7 5 1.7	9.399
7	12 45 23.08	1.8934	7 14 24.7	9.368
8	12 47 16.71	1.8942	7 23 45.8	9.336
9	12 49 10.39	1.8952	7 33 5.0	9.303
10	12 51 4.13	1.8962	7 42 22.2	9.270
11	12 52 57.93	1.8972	7 51 37.4	9.237
12	12 54 51.80	1.8983	8 0 50.7	9.204
13	12 56 45.73	1.8994	8 10 1.9	9.169
14	12 58 39.73	1.9006	8 19 11.0	9.134
15	13 0 33.80	1.9018	8 28 13.0	9.098
16	13 2 27.94	1.9030	8 37 22.8	9.062
17	13 4 22.16	1.9043	8 46 25.4	9.026
18	13 6 16.46	1.9057	8 55 25.9	8.989
19	13 8 10.84	1.9071	9 4 24.1	8.951
20	13 10 5.31	1.9085	9 13 20.0	8.912
21	13 11 59.86	1.9099	9 22 13.6	8.874
22	13 13 54.50	1.9114	9 31 4.9	8.835
23	13 15 49.23	1.9130	S. 9 39 53.8	8.796

THURSDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 17 44.06	1.9146	S. 9 48 40.4	8.756
1	13 19 38.98	1.9163	9 57 24.5	8.714
2	13 21 34.01	1.9180	10 6 6.1	8.672
3	13 23 29.14	1.9197	10 14 45.2	8.631
4	13 25 24.38	1.9215	10 23 21.8	8.589
5	13 27 19.72	1.9233	10 31 55.9	8.547
6	13 29 15.17	1.9252	10 40 27.4	8.503
7	13 31 10.74	1.9271	10 48 56.2	8.458
8	13 33 6.42	1.9289	10 57 22.3	8.413
9	13 35 2.21	1.9308	11 5 45.8	8.368
10	13 36 58.12	1.9329	11 14 6.5	8.323
11	13 38 54.16	1.9350	11 22 24.5	8.277
12	13 40 50.32	1.9371	11 30 39.7	8.230
13	13 42 46.61	1.9392	11 38 52.1	8.182
14	13 44 43.03	1.9414	11 47 1.6	8.134
15	13 46 39.58	1.9436	11 55 8.2	8.086
16	13 48 36.26	1.9458	12 3 11.9	8.037
17	13 50 33.08	1.9482	12 11 12.7	7.988
18	13 52 30.04	1.9505	12 19 10.5	7.938
19	13 54 27.14	1.9528	12 27 5.3	7.887
20	13 56 24.38	1.9552	12 34 57.0	7.836
21	13 58 21.76	1.9576	12 42 45.6	7.784
22	14 0 19.29	1.9601	12 50 31.1	7.732
23	14 2 16.97	1.9626	12 58 13.4	7.679
24	14 4 14.80	1.9651	S. 13 5 52.6	7.626

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
FRIDAY 13.					SUNDAY 15.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 4 14.80	1.9651	S.13 5 52.6	7.626	0	15 41 57.66	2.1127	S.17 59 15.3	4.368
1	14 6 12.78	1.9677	13 13 28.5	7.572	1	15 44 4.52	2.1161	18 3 34.9	4.285
2	14 8 10.92	1.9702	13 21 1.2	7.517	2	15 46 11.59	2.1195	18 7 49.5	4.202
3	14 10 9.21	1.9728	13 28 30.6	7.462	3	15 48 18.86	2.1228	18 11 59.1	4.118
4	14 12 7.66	1.9755	13 35 56.6	7.406	4	15 50 26.33	2.1261	18 16 3.7	4.035
5	14 14 6.27	1.9782	13 43 19.3	7.350	5	15 52 33.99	2.1293	18 20 3.3	3.951
6	14 16 5.04	1.9809	13 50 38.6	7.293	6	15 54 41.85	2.1327	18 23 57.8	3.865
7	14 18 3.98	1.9837	13 57 54.5	7.236	7	15 56 49.91	2.1360	18 27 47.1	3.778
8	14 20 3.08	1.9864	14 5 6.9	7.178	8	15 58 58.17	2.1393	18 31 31.2	3.691
9	14 22 2.35	1.9892	14 12 15.8	7.119	9	16 1 6.63	2.1426	18 35 10.0	3.603
10	14 24 1.79	1.9921	14 19 21.2	7.060	10	16 3 15.28	2.1458	18 38 43.6	3.516
11	14 26 1.40	1.9948	14 26 23.0	7.000	11	16 5 24.13	2.1491	18 42 11.9	3.428
12	14 28 1.17	1.9977	14 33 21.2	6.940	12	16 7 33.17	2.1523	18 45 35.0	3.340
13	14 30 1.12	2.0007	14 40 15.8	6.879	13	16 9 42.41	2.1556	18 48 52.7	3.250
14	14 32 1.25	2.0036	14 47 6.7	6.817	14	16 11 51.84	2.1588	18 52 5.0	3.159
15	14 34 1.55	2.0065	14 53 53.9	6.755	15	16 14 1.46	2.1619	18 55 11.8	3.068
16	14 36 2.03	2.0095	15 0 37.3	6.692	16	16 16 11.27	2.1651	18 58 13.2	2.977
17	14 38 2.69	2.0125	15 7 16.9	6.628	17	16 18 21.27	2.1682	19 1 9.1	2.886
18	14 40 3.53	2.0155	15 13 52.7	6.565	18	16 20 31.46	2.1714	19 3 59.5	2.793
19	14 42 4.55	2.0186	15 20 24.7	6.501	19	16 22 41.84	2.1745	19 6 44.3	2.700
20	14 44 5.76	2.0217	15 26 52.8	6.436	20	16 24 52.40	2.1776	19 9 23.5	2.607
21	14 46 7.15	2.0247	15 33 17.0	6.371	21	16 27 3.15	2.1807	19 11 57.2	2.514
22	14 48 8.73	2.0278	15 39 37.3	6.305	22	16 29 14.08	2.1837	19 14 25.2	2.419
23	14 50 10.49	2.0309	S.15 45 53.6	6.238	23	16 31 25.20	2.1868	S.19 16 47.5	2.324
SATURDAY 14.					MONDAY 16.				
0	14 52 12.44	2.0341	S.15 52 5.8	6.170	0	16 33 36.50	2.1898	S.19 19 4.1	2.229
1	14 54 14.58	2.0372	15 58 14.0	6.102	1	16 35 47.98	2.1928	19 21 15.0	2.133
2	14 56 16.91	2.0404	16 4 18.0	6.033	2	16 37 59.63	2.1957	19 23 20.1	2.037
3	14 58 19.43	2.0436	16 10 17.9	5.963	3	16 40 11.46	2.1987	19 25 19.4	1.940
4	15 0 22.14	2.0468	16 16 13.6	5.893	4	16 42 23.47	2.2016	19 27 12.9	1.842
5	15 2 25.04	2.0500	16 22 5.1	5.823	5	16 44 35.65	2.2044	19 29 0.5	1.744
6	15 4 28.14	2.0532	16 27 52.4	5.752	6	16 46 48.00	2.2072	19 30 42.2	1.646
7	15 6 31.43	2.0565	16 33 35.4	5.681	7	16 49 0.52	2.2101	19 32 18.0	1.547
8	15 8 34.92	2.0597	16 39 14.1	5.608	8	16 51 13.21	2.2129	19 33 47.9	1.448
9	15 10 38.60	2.0630	16 44 48.4	5.535	9	16 53 26.07	2.2157	19 35 11.8	1.349
10	15 12 42.48	2.0663	16 50 18.3	5.462	10	16 55 39.09	2.2183	19 36 29.8	1.249
11	15 14 46.56	2.0697	16 55 43.8	5.388	11	16 57 52.27	2.2210	19 37 41.7	1.148
12	15 16 50.84	2.0730	17 1 4.8	5.313	12	17 0 5.61	2.2237	19 38 47.6	1.047
13	15 18 55.32	2.0762	17 6 21.3	5.238	13	17 2 19.11	2.2262	19 39 47.4	0.946
14	15 20 59.99	2.0795	17 11 33.3	5.162	14	17 4 32.76	2.2288	19 40 41.1	0.844
15	15 23 4.86	2.0828	17 16 40.7	5.085	15	17 6 46.57	2.2314	19 41 28.7	0.742
16	15 25 9.93	2.0862	17 21 43.5	5.007	16	17 9 0.53	2.2339	19 42 10.2	0.640
17	15 27 15.20	2.0894	17 26 41.6	4.929	17	17 11 14.64	2.2364	19 42 45.5	0.537
18	15 29 20.66	2.0927	17 31 35.0	4.851	18	17 13 28.90	2.2388	19 43 14.6	0.433
19	15 31 26.32	2.0961	17 36 23.7	4.772	19	17 15 43.30	2.2412	19 43 37.5	0.330
20	15 33 32.19	2.0995	17 41 7.7	4.693	20	17 17 57.84	2.2435	19 43 54.2	0.226
21	15 35 38.26	2.1028	17 45 46.9	4.613	21	17 20 12.52	2.2458	19 44 4.6	0.122
22	15 37 44.53	2.1062	17 50 21.2	4.532	22	17 22 27.34	2.2482	19 44 8.8	− 0.017
23	15 39 51.00	2.1094	17 54 50.7	4.451	23	17 24 42.30	2.2504	19 44 6.7	+ 0.087
24	15 41 57.66	2.1127	S.17 59 15.3	4.368	24	17 26 57.39	2.2526	S.19 43 58.3	0.192

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 17.					**THURSDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 26 57.39	2.2526	S. 19 43 58.3	0.192	0	19 16 42.75	2.3021	S. 17 30 41.7	5.351
1	17 29 12.61	2.2547	19 43 43.6	0.298	1	19 19 0.87	2.3020	17 25 17.5	5.455
2	17 31 27.95	2.2568	19 43 22.5	0.404	2	19 21 18.99	2.3019	17 19 47.1	5.559
3	17 33 43.42	2.2589	19 42 55.1	0.510	3	19 23 37.10	2.3017	17 14 10.4	5.662
4	17 35 59.02	2.2609	19 42 21.3	0.617	4	19 25 55.20	2.3015	17 8 27.6	5.765
5	17 38 14.73	2.2628	19 41 41.1	0.723	5	19 28 13.28	2.3012	17 2 38.6	5.867
6	17 40 30.56	2.2648	19 40 54.5	0.830	6	19 30 31.34	2.3008	16 56 43.5	5.969
7	17 42 46.51	2.2667	19 40 1.5	0.937	7	19 32 49.38	2.3005	16 50 42.3	6.071
8	17 45 2.57	2.2685	19 39 2.0	1.045	8	19 35 7.40	2.3002	16 44 35.0	6.172
9	17 47 18.73	2.2702	19 37 56.1	1.152	9	19 37 25.40	2.2998	16 38 21.7	6.272
10	17 49 35.00	2.2720	19 36 43.8	1.259	10	19 39 43.37	2.2993	16 32 2.4	6.372
11	17 51 51.37	2.2737	19 35 25.0	1.367	11	19 42 1.31	2.2988	16 25 37.1	6.472
12	17 54 7.84	2.2753	19 33 59.7	1.476	12	19 44 19.22	2.2983	16 19 5.8	6.571
13	17 56 24.41	2.2769	19 32 27.9	1.584	13	19 46 37.10	2.2977	16 12 28.6	6.668
14	17 58 41.07	2.2785	19 30 49.6	1.692	14	19 48 54.94	2.2971	16 5 45.6	6.766
15	18 0 57.83	2.2800	19 29 4.9	1.799	15	19 51 12.75	2.2965	15 58 56.7	6.863
16	18 3 14.67	2.2814	19 27 13.7	1.908	16	19 53 30.52	2.2958	15 52 2.0	6.960
17	18 5 31.60	2.2828	19 25 15.9	2.017	17	19 55 48.25	2.2952	15 45 1.5	7.056
18	18 7 48.61	2.2842	19 23 11.6	2.126	18	19 58 5.94	2.2945	15 37 55.3	7.151
19	18 10 5.70	2.2855	19 21 0.8	2.234	19	20 0 23.59	2.2937	15 30 43.4	7.246
20	18 12 22.87	2.2867	19 18 43.5	2.343	20	20 2 41.19	2.2929	15 23 25.8	7.340
21	18 14 40.11	2.2879	19 16 19.6	2.452	21	20 4 58.74	2.2921	15 16 2.6	7.433
22	18 16 57.42	2.2891	19 13 49.2	2.561	22	20 7 16.24	2.2913	15 8 33.8	7.526
23	18 19 14.80	2.2902	S. 19 11 12.3	2.669	23	20 9 33.70	2.2906	S. 15 0 59.4	7.619
	WEDNESDAY 18.					**FRIDAY 20.**			
0	18 21 32.25	2.2913	S. 19 8 28.9	2.778	0	20 11 51.11	2.2897	S. 14 53 19.5	7.710
1	18 23 49.76	2.2923	19 5 38.9	2.887	1	20 14 8.46	2.2888	14 45 34.2	7.801
2	18 26 7.33	2.2932	19 2 42.4	2.996	2	20 16 25.76	2.2879	14 37 43.4	7.891
3	18 28 24.95	2.2941	18 59 39.4	3.104	3	20 18 43.01	2.2870	14 29 47.3	7.979
4	18 30 42.62	2.2949	18 56 29.9	3.213	4	20 21 0.20	2.2860	14 21 45.9	8.068
5	18 33 0.34	2.2958	18 53 13.8	3.322	5	20 23 17.33	2.2851	14 13 39.2	8.156
6	18 35 18.11	2.2966	18 49 51.2	3.431	6	20 25 34.41	2.2841	14 5 27.2	8.243
7	18 37 35.93	2.2973	18 46 22.1	3.539	7	20 27 51.43	2.2831	13 57 10.0	8.329
8	18 39 53.79	2.2979	18 42 46.5	3.647	8	20 30 8.38	2.2820	13 48 47.7	8.414
9	18 42 11.68	2.2985	18 39 4.4	3.756	9	20 32 25.27	2.2810	13 40 20.3	8.498
10	18 44 29.61	2.2991	18 35 15.8	3.864	10	20 34 42.10	2.2800	13 31 47.9	8.582
11	18 46 47.57	2.2996	18 31 20.7	3.972	11	20 36 58.87	2.2790	13 23 10.5	8.665
12	18 49 5.56	2.3001	18 27 19.2	4.079	12	20 39 15.58	2.2779	13 14 28.1	8.747
13	18 51 23.58	2.3005	18 23 11.2	4.187	13	20 41 32.22	2.2768	13 5 40.8	8.828
14	18 53 41.62	2.3008	18 18 56.8	4.294	14	20 43 48.80	2.2757	12 56 48.7	8.909
15	18 55 59.68	2.3012	18 14 36.0	4.401	15	20 46 5.31	2.2747	12 47 51.7	8.989
16	18 58 17.76	2.3015	18 10 8.7	4.508	16	20 48 21.76	2.2736	12 38 50.0	9.067
17	19 0 35.86	2.3017	18 5 35.0	4.614	17	20 50 38.14	2.2724	12 29 43.7	9.144
18	19 2 53.97	2.3019	18 0 55.0	4.720	18	20 52 54.45	2.2713	12 20 32.7	9.221
19	19 5 12.09	2.3021	17 56 8.6	4.826	19	20 55 10.70	2.2702	12 11 17.1	9.297
20	19 7 30.22	2.3022	17 51 15.8	4.932	20	20 57 26.88	2.2691	12 1 57.0	9.372
21	19 9 48.35	2.3022	17 46 16.7	5.037	21	20 59 42.99	2.2680	11 52 32.4	9.447
22	19 12 6.49	2.3022	17 41 11.3	5.142	22	21 1 59.04	2.2669	11 43 3.4	9.520
23	19 14 24.62	2.3022	17 35 59.6	5.247	23	21 4 15.02	2.2657	11 33 30.0	9.592
24	19 16 42.75	2.3021	S. 17 30 41.7	5.351	24	21 6 30.93	2.2646	S. 11 23 52.3	9.663

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 21.					MONDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 6 30.93	2.2646	S. 11 23 52.3	9.663	0	22 54 8.30	2.2278	S. 2 37 50.6	11.826
1	21 8 46.77	2.2635	11 14 10.4	9.733	1	22 56 21.96	2.2277	2 26 0.5	11.843
2	21 11 2.55	2.2624	11 4 24.3	9.803	2	22 58 35.62	2.2276	2 14 9.4	11.860
3	21 13 18.26	2.2613	10 54 34.0	9.872	3	23 0 49.27	2.2275	2 2 17.3	11.875
4	21 15 33.90	2.2602	10 44 39.7	9.938	4	23 3 2.92	2.2275	1 50 24.4	11.887
5	21 17 49.48	2.2591	10 34 41.4	10.004	5	23 5 16.57	2.2276	1 38 30.8	11.899
6	21 20 4.99	2.2579	10 24 39.2	10.069	6	23 7 30.23	2.2277	1 26 36.5	11.910
7	21 22 20.43	2.2568	10 14 33.1	10.134	7	23 9 43.89	2.2278	1 14 41.6	11.920
8	21 24 35.81	2.2557	10 4 23.1	10.198	8	23 11 57.56	2.2279	1 2 46.1	11.929
9	21 26 51.12	2.2547	9 54 9.3	10.261	9	23 14 11.24	2.2281	0 50 50.1	11.937
10	21 29 6.37	2.2536	9 43 51.8	10.322	10	23 16 24.93	2.2282	0 38 53.7	11.943
11	21 31 21.55	2.2525	9 33 30.7	10.381	11	23 18 38.63	2.2284	0 26 57.0	11.948
12	21 33 36.67	2.2515	9 23 6.1	10.439	12	23 20 52.34	2.2287	0 15 0.0	11.952
13	21 35 51.73	2.2505	9 12 38.0	10.496	13	23 23 6.07	2.2291	S. 0 3 2.8	11.954
14	21 38 6.73	2.2494	9 2 6.4	10.556	14	23 25 19.83	2.2295	N. 0 8 54.5	11.955
15	21 40 21.66	2.2483	8 51 31.3	10.612	15	23 27 33.61	2.2299	0 20 51.8	11.954
16	21 42 36.53	2.2473	8 40 52.9	10.667	16	23 29 47.42	2.2304	0 32 49.0	11.953
17	21 44 51.34	2.2464	8 30 11.3	10.720	17	23 32 1.26	2.2308	0 44 46.2	11.952
18	21 47 6.10	2.2455	8 19 26.5	10.773	18	23 34 15.12	2.2313	0 56 43.3	11.949
19	21 49 20.80	2.2445	8 8 38.5	10 825	19	23 36 29.02	2.2319	1 8 40.1	11.944
20	21 51 35.44	2.2436	7 57 47.5	10.875	20	23 38 42.95	2.2325	1 20 36.6	11.937
21	21 53 50.03	2.2427	7 46 53.5	10.924	21	23 40 56.92	2.2332	1 32 32.6	11 930
22	21 56 4.57	2.2418	7 35 56.6	10.972	22	23 43 10.93	2.2338	1 44 28.2	11.922
23	21 58 19.05	2.2409	S. 7 24 56.8	11.020	23	23 45 24.98	2.2345	N. 1 56 23.3	11.912
	SUNDAY 22.					TUESDAY 24.			
0	22 0 33.48	2.2401	S. 7 13 54.2	11.066	0	23 47 39.07	2.2353	N. 2 8 17.7	11.901
1	22 2 47.86	2.2392	7 2 48.9	11.111	1	23 49 53.21	2.2361	2 20 11.4	11.889
2	22 5 2.19	2.2384	6 51 40.9	11.155	2	23 52 7.40	2.2369	2 32 4.4	11.877
3	22 7 16.47	2.2377	6 40 30.3	11.197	3	23 54 21.64	2.2378	2 43 56.6	11.863
4	22 9 30.71	2.2369	6 29 17.2	11.239	4	23 56 35.94	2.2387	2 55 47.9	11.847
5	22 11 44.90	2.2362	6 18 1.6	11.279	5	23 58 50.29	2.2397	3 7 38.2	11.830
6	22 13 59.05	2.2355	6 6 43.7	11.318	6	0 1 4.70	2.2407	3 19 27.5	11.812
7	22 16 13.16	2.2348	5 55 23.4	11.357	7	0 3 19.17	2.2417	3 31 15.7	11.792
8	22 18 27.23	2.2342	5 44 0.8	11.394	8	0 5 33.71	2.2428	3 43 2.6	11.772
9	22 20 41.26	2.2335	5 32 36.1	11.429	9	0 7 48.31	2.2439	3 54 48.3	11.751
10	22 22 55.25	2.2329	5 21 9.3	11.464	10	0 10 2.98	2.2451	4 6 32.7	11.728
11	22 25 9.21	2.2323	5 9 40.4	11.498	11	0 12 17.72	2.2463	4 18 15.7	11.704
12	22 27 23.13	2.2317	4 58 9.5	11.531	12	0 14 32.53	2.2475	4 29 57.2	11.679
13	22 29 37.02	2.2312	4 46 36.7	11.562	13	0 16 47.42	2.2487	4 41 37.2	11.652
14	22 31 50.88	2.2306	4 35 2.1	11.592	14	0 19 2.38	2.2500	4 53 15.5	11.624
15	22 34 4.72	2.2304	4 23 25.7	11.621	15	0 21 17.42	2.2514	5 4 52.1	11.596
16	22 36 18.53	2.2300	4 11 47.6	11.648	16	0 23 32.55	2.2528	5 16 27.0	11.566
17	22 38 32.32	2.2296	4 0 7.9	11.674	17	0 25 47.76	2.2542	5 28 0.0	11.534
18	22 40 46.08	2.2292	3 48 26.7	11.699	18	0 28 3.05	2.2556	5 39 31.1	11.502
19	22 42 59.82	2.2289	3 36 44.0	11.723	19	0 30 18.43	2.2571	5 51 0.2	11.468
20	22 45 13.55	2.2286	3 24 59.9	11.747	20	0 32 33.90	2.2587	6 2 27.3	11.434
21	22 47 27.26	2.2283	3 13 14.4	11.769	21	0 34 49.47	2.2602	6 13 52.3	11.398
22	22 49 40.95	2.2281	3 1 27.6	11.790	22	0 37 5.13	2.2618	6 25 15.1	11.361
23	22 51 54.63	2.2279	2 49 39.6	11.808	23	0 39 20.89	2.2634	6 36 35.6	11.322
24	22 54 8.30	2.2278	S. 2 37 50.6	11.826	24	0 41 36.74	2.2650	N. 6 47 53.7	11.282

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 25.					FRIDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 41 36.74	2.2650	N. 6 47 53.7	11.282	0	2 32 44.47	2.3713	N.14 42 15.4	8.064
1	0 43 52.69	2.2668	6 59 9.4	11.242	1	2 35 6.82	2.3736	14 50 16.5	7.972
2	0 46 8.75	2.2686	7 10 22.7	11.201	2	2 37 29.31	2.3759	14 58 12.0	7.878
3	0 48 24.92	2.2703	7 21 33.5	11.158	3	2 39 51.93	2.3782	15 6 1.8	7.783
4	0 50 41.19	2.2721	7 32 41.7	11.113	4	2 42 14.69	2.3806	15 13 45.9	7.688
5	0 52 57.57	2.2739	7 43 47.1	11.067	5	2 44 37.60	2.3830	15 21 24.3	7.593
6	0 55 14.06	2.2758	7 54 49.7	11.020	6	2 47 0.65	2.3853	15 28 57.0	7.496
7	0 57 30.66	2.2777	8 5 49.5	10.973	7	2 49 23.84	2.3876	15 36 23.8	7.397
8	0 59 47.38	2.2796	8 16 46.5	10.925	8	2 51 47.16	2.3898	15 43 44.6	7.298
9	1 2 4.21	2.2815	8 27 40.5	10.874	9	2 54 10.62	2.3921	15 50 59.5	7.198
10	1 4 21.16	2.2835	8 38 31.4	10.823	10	2 56 34.21	2.3943	15 58 8.4	7.097
11	1 6 38.23	2.2854	8 49 19.2	10.771	11	2 58 57.93	2.3965	16 5 11.2	6.996
12	1 8 55.41	2.2874	9 0 3.9	10.717	12	3 1 21.79	2.3987	16 12 7.9	6.894
13	1 11 12.72	2.2896	9 10 45.3	10.662	13	3 3 45.78	2.4008	16 18 58.5	6.791
14	1 13 30.16	2.2917	9 21 23.4	10.607	14	3 6 9.89	2.4029	16 25 42.8	6.687
15	1 15 47.72	2.2938	9 31 58.2	10.551	15	3 8 34.13	2.4051	16 32 20.9	6.583
16	1 18 5.41	2.2959	9 42 29.5	10.493	16	3 10 58.50	2.4072	16 38 52.7	6.477
17	1 20 23.23	2.2980	9 52 57.3	10.433	17	3 13 22.99	2.4092	16 45 18.2	6.372
18	1 22 41.17	2.3002	10 3 21.5	10.372	18	3 15 47.60	2.4112	16 51 37.3	6.265
19	1 24 59.25	2.3024	10 13 42.0	10.311	19	3 18 12.33	2.4132	16 57 50.0	6.157
20	1 27 17.46	2.3046	10 23 58.8	10.248	20	3 20 37.18	2.4151	17 3 56.2	6.048
21	1 29 35.80	2.3068	10 34 11.8	10.184	21	3 23 2.14	2.4170	17 9 55.8	5.939
22	1 31 54.28	2.3091	10 44 20.9	10.119	22	3 25 27.22	2.4188	17 15 48.9	5.830
23	1 34 12.89	2.3113	N.10 54 26.1	10.054	23	3 27 52.40	2.4206	N.17 21 35.4	5.719
	THURSDAY 26.					SATURDAY 28.			
0	1 36 31.64	2.3137	N.11 4 27.4	9.987	0	3 30 17.69	2.4224	N.17 27 15.2	5.607
1	1 38 50.53	2.3160	11 14 24.6	9.919	1	3 32 43.09	2.4242	17 32 48.3	5.496
2	1 41 9.56	2.3183	11 24 17.7	9.850	2	3 35 8.59	2.4258	17 38 14.7	5.384
3	1 43 28.72	2.3206	11 34 6.6	9.779	3	3 37 34.19	2.4275	17 43 34.4	5.271
4	1 45 48.03	2.3230	11 43 51.2	9.708	4	3 39 59.89	2.4292	17 48 47.2	5.157
5	1 48 7.48	2.3253	11 53 31.6	9.637	5	3 42 25.69	2.4308	17 53 53.2	5.043
6	1 50 27.07	2.3277	12 3 7.6	9.563	6	3 44 51.58	2.4323	17 58 52.4	4.929
7	1 52 46.80	2.3301	12 12 39.2	9.488	7	3 47 17.56	2.4337	18 3 44.7	4.813
8	1 55 6.68	2.3325	12 22 6.2	9.412	8	3 49 43.62	2.4351	18 8 30.0	4.697
9	1 57 26.70	2.3349	12 31 28.6	9.335	9	3 52 9.77	2.4364	18 13 8.3	4.580
10	1 59 46.87	2.3373	12 40 46.4	9.258	10	3 54 35.99	2.4377	18 17 39.6	4.463
11	2 2 7.18	2.3397	12 49 59.6	9.180	11	3 57 2.29	2.4390	18 22 3.9	4.346
12	2 4 27.64	2.3422	12 59 8.0	9.100	12	3 59 28.67	2.4402	18 26 21.1	4.228
13	2 6 48.24	2.3446	13 8 11.6	9.019	13	4 1 55.12	2.4413	18 30 31.2	4.109
14	2 9 8.99	2.3471	13 17 10.3	8.937	14	4 4 21.63	2.4424	18 34 34.2	3.991
15	2 11 29.89	2.3495	13 26 4.0	8.854	15	4 6 48.21	2.4435	18 38 30.1	3.872
16	2 13 50.93	2.3518	13 34 52.7	8.770	16	4 9 14.85	2.4444	18 42 18.8	3.752
17	2 16 12.11	2.3542	13 43 36.4	8.685	17	4 11 41.54	2.4453	18 46 0.3	3.632
18	2 18 33.44	2.3567	13 52 14.9	8.598	18	4 14 8.29	2.4462	18 49 34.6	3.512
19	2 20 54.91	2.3591	14 0 48.2	8.512	19	4 16 35.09	2.4470	18 53 1.7	3.391
20	2 23 16.53	2.3616	14 9 16.3	8.425	20	4 19 1.93	2.4477	18 56 21.5	3.269
21	2 25 38.30	2.3640	14 17 39.2	8.337	21	4 21 28.82	2.4484	18 59 34.0	3.148
22	2 28 0.21	2.3664	14 25 56.7	8.247	22	4 23 55.74	2.4490	19 2 39.2	3.026
23	2 30 22.27	2.3688	14 34 8.8	8.156	23	4 26 22.70	2.4496	19 5 37.1	2.903
24	2 32 44.47	2.3713	N.14 42 15.4	8.064	24	4 28 49.69	2.4500	N.19 8 27.6	2.781

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 28 49.69	2.4500	N.19 8 27.6	2.781
1	4 31 16.70	2.4504	19 11 10.8	2.658
2	4 33 43.74	2.4508	19 13 46.6	2.535
3	4 36 10.80	2.4511	19 16 15.0	2.413
4	4 38 37.87	2.4513	19 18 36.1	2.290
5	4 41 4.95	2.4514	19 20 49.8	2.166
6	4 43 32.04	2.4515	19 22 56.0	2.042
7	4 45 59.13	2.4515	19 24 54.8	1.918
8	4 48 26.22	2.4514	19 26 46.2	1.795
9	4 50 53.30	2.4513	19 28 30.2	1.671
10	4 53 20.37	2.4511	19 30 6.7	1.547
11	4 55 47.43	2.4508	19 31 35.8	1.422
12	4 58 14.47	2.4504	19 32 57.4	1.298
13	5 0 41.48	2.4500	19 34 11.6	1.174
14	5 3 8.47	2.4496	19 35 18.3	1.050
15	5 5 35.43	2.4490	19 36 17.6	0.926
16	5 8 2.35	2.4483	19 37 9.4	0.802
17	5 10 29.23	2.4477	19 37 53.8	0.677
18	5 12 56.07	2.4469	19 38 30.7	0.553
19	5 15 22.86	2.4460	19 39 0.2	0.429
20	5 17 49.59	2.4450	19 39 22.2	0.305
21	5 20 16.26	2.4440	19 39 36.8	0.182
22	5 22 42.87	2.4429	19 39 44.0	+ 0.058
23	5 25 9.41	2.4418	N.19 39 43.8	− 0.065

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 27 35.89	2.4406	N.19 39 36.2	0.188
1	5 30 2.29	2.4393	19 39 21.2	0.312
2	5 32 28.61	2.4380	19 38 58.8	0.434
3	5 34 54.85	2.4366	19 38 29.1	0.557
4	5 37 21.00	2.4350	19 37 52.0	0.679
5	5 39 47.05	2.4334	19 37 7.6	0.801
6	5 42 13.01	2.4318	19 36 15.9	0.922
7	5 44 38.87	2.4301	19 35 16.9	1.044
8	5 47 4.62	2.4283	19 34 10.6	1.165
9	5 49 30.26	2.4264	19 32 57.1	1.286
10	5 51 55.79	2.4245	19 31 36.3	1.407
11	5 54 21.20	2.4226	19 30 8.3	1.526
12	5 56 46.50	2.4206	19 28 33.2	1.645
13	5 59 11.67	2.4184	19 26 50.9	1.764
14	6 1 36.70	2.4161	19 25 1.5	1.883
15	6 4 1.60	2.4139	19 23 4.9	2.001
16	6 6 26.37	2.4116	19 21 1.3	2.119
17	6 8 50.99	2.4092	19 18 50.6	2.237
18	6 11 15.47	2.4067	19 16 32.9	2.353
19	6 13 39.80	2.4042	19 14 8.2	2.469
20	6 16 3.98	2.4017	19 11 36.6	2.585
21	6 18 28.00	2.3990	19 8 58.0	2.701
22	6 20 51.86	2.3963	19 6 12.5	2.815
23	6 23 15.56	2.3936	19 3 20.2	2.928
24	6 25 39.09	2.3907	N.19 0 21.1	3.042

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 25 39.09	2.3907	N.19 0 21.1	3.042
1	6 28 2.45	2.3878	18 57 15.2	3.154
2	6 30 25.63	2.3849	18 54 2.6	3.267
3	6 32 48.64	2.3820	18 50 43.2	3.379
4	6 35 11.47	2.3789	18 47 17.1	3.490
5	6 37 34.11	2.3758	18 43 44.4	3.599
6	6 39 56.57	2.3727	18 40 5.2	3.708
7	6 42 18.84	2.3695	18 36 19.4	3.817
8	6 44 40.91	2.3662	18 32 27.1	3.926
9	6 47 2.79	2.3630	18 28 28.3	4.033
10	6 49 24.47	2.3597	18 24 23.1	4.139
11	6 51 45.95	2.3563	18 20 11.6	4.244
12	6 54 7.22	2.3528	18 15 53.8	4.349
13	6 56 28.29	2.3493	18 11 29.7	4.454
14	6 58 49.14	2.3458	18 6 59.3	4.558
15	7 1 9.78	2.3423	18 2 22.7	4.661
16	7 3 30.21	2.3387	17 57 40.0	4.763
17	7 5 50.42	2.3350	17 52 51.2	4.864
18	7 8 10.41	2.3313	17 47 56.3	4.965
19	7 10 30.18	2.3276	17 42 55.4	5.064
20	7 12 49.72	2.3238	17 37 48.6	5.162
21	7 15 9.04	2.3201	17 32 36.0	5.259
22	7 17 28.13	2.3163	17 27 17.5	5.357
23	7 19 46.99	2.3124	N.17 21 53.2	5.453

WEDNESDAY, AUGUST 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 22 5.62	2.3085	N.17 16 23.1	5.549

PHASES OF THE MOON.

	d	h	m
● New Moon	4	3	3.5
☽ First Quarter . . .	11	19	49.3
○ Full Moon	19	15	30.9
☾ Last Quarter	26	12	13.3

	d	h
☾ Apogee	12	3.4
☾ Perigee	25	0.6

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Fomalhaut	W.	85° 36′ 45″	2703	87° 13′ 21″	2704	88° 49′ 55″	2707	90° 26′ 26″	2710
	α Pegasi	W.	68 17 25	2432	70 0 14	2431	71 43 5	2429	73 25 58	2429
	Sun	E.	41 8 3	2577	39 28 36	2582	37 49 16	2587	36 10 4	2593
2	Fomalhaut	W.	98 27 25	2744	100 3 7	2755	101 38 34	2766	103 13 46	2780
	α Pegasi	W.	82 0 1	2440	83 42 38	2445	85 25 9	2450	87 7 33	2455
	Sun	E.	27 56 42	2642	26 18 44	2656	24 41 5	2672	23 3 48	2691
6	Sun	W.	24 2 55	3019	25 32 44	3026	27 2 25	3034	28 31 55	3044
	Spica	E.	74 32 22	2612	72 53 44	2627	71 15 26	2641	69 37 27	2656
	Antares	E.	119 52 38	2655	118 14 58	2669	116 37 36	2681	115 0 31	2695
7	Sun	W.	35 56 10	3101	37 24 18	3114	38 52 10	3126	40 19 46	3140
	Spica	E.	61 32 21	2726	59 56 16	2741	58 20 30	2754	56 45 2	2768
	Antares	E.	106 59 33	2762	105 24 15	2775	103 49 14	2788	102 14 31	2801
8	Sun	W.	47 33 53	3905	48 59 56	3918	50 25 44	3930	51 51 17	3943
	Spica	E.	48 52 11	2835	47 18 28	2848	45 45 2	2860	44 11 52	2873
	Antares	E.	94 25 15	2868	92 52 15	2880	91 19 31	2892	89 47 2	2904
9	Sun	W.	58 55 26	3302	60 19 35	3312	61 43 32	3323	63 7 17	3333
	Regulus	W.	18 4 17	3111	19 32 13	3096	21 0 28	3086	22 28 55	3078
	Spica	E.	36 29 51	2930	34 58 10	2940	33 26 42	2950	31 55 27	2960
	Antares	E.	82 8 26	2963	80 37 27	2973	79 6 41	2983	77 36 7	2993
10	Sun	W.	70 3 13	3378	71 25 54	3386	72 48 26	3393	74 10 50	3400
	Regulus	W.	29 52 22	3073	31 21 4	3074	32 49 45	3077	34 18 23	3078
	Antares	E.	70 6 22	3040	68 36 59	3048	67 7 46	3056	65 38 42	3063
11	Sun	W.	81 1 1	3428	82 22 46	3432	83 44 26	3436	85 6 2	3438
	Regulus	W.	41 40 56	3089	43 9 19	3091	44 37 40	3092	46 6 0	3093
	Antares	E.	58 15 31	3095	56 47 15	3100	55 19 6	3105	53 51 3	3110
	α Aquilæ	E.	108 53 24	3500	107 33 0	3496	106 12 31	3492	104 51 58	3489
12	Sun	W.	91 53 23	3446	93 14 47	3446	94 36 11	3446	95 57 35	3445
	Regulus	W.	53 27 26	3093	54 55 44	3092	56 24 3	3091	57 52 24	3089
	Antares	E.	46 32 8	3130	45 4 35	3133	43 37 6	3137	42 9 41	3139
	α Aquilæ	E.	98 8 24	3475	96 47 32	3472	95 26 37	3471	94 5 40	3468
13	Sun	W.	102 45 6	3432	104 6 46	3429	105 28 30	3424	106 50 19	3419
	Regulus	W.	65 14 53	3073	66 43 36	3069	68 12 23	3064	69 41 16	3059
	Antares	E.	34 53 33	3157	33 26 33	3162	31 59 39	3168	30 32 52	3175
	α Aquilæ	E.	87 20 11	3455	85 58 57	3453	84 37 40	3450	83 16 20	3448
14	Sun	W.	113 40 59	3388	115 3 29	3380	116 26 8	3373	117 48 55	3365
	Regulus	W.	77 7 29	3027	78 37 8	3019	80 6 57	3012	81 36 55	3004
	Spica	W.	23 15 54	3009	24 45 55	3002	26 16 5	2994	27 46 25	2986
	α Aquilæ	E.	76 29 8	3439	75 7 36	3438	73 46 2	3438	72 24 28	3437
	Fomalhaut	E.	105 56 59	3500	104 36 35	3487	103 15 56	3472	101 55 1	3459
15	Sun	W.	124 45 22	3319	126 9 12	3308	127 33 14	3299	128 57 27	3288
	Regulus	W.	89 9 27	2958	90 40 32	2948	92 11 50	2937	93 43 22	2926
	Spica	W.	35 20 46	2940	36 52 14	2931	38 23 54	2920	39 55 48	2909

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Fomalhaut	W.	92° 2′ 53″	2714	93° 39′ 14″	2720	95° 15′ 27″	2727	96° 51′ 31″	2735
	α Pegasi	W.	75 8 51	2430	76 51 43	2431	78 34 33	2434	80 17 19	2437
	Sun	E.	34 31 0	2601	32 52 6	2610	31 13 24	2620	29 34 56	2630
2	Fomalhaut	W.	104 48 40	2795	106 23 15	2810	107 57 30	2828	109 31 22	2848
	α Pegasi	W.	88 49 49	2462	90 31 56	2469	92 13 53	2477	93 55 39	2485
	Sun	E.	21 26 56	2713	19 50 33	2740	18 14 46	2773	16 39 43	2814
6	Sun	W.	30 1 13	3055	31 30 18	3065	32 59 10	3078	34 27 47	3089
	Spica	E.	67 59 48	2670	66 22 28	2684	64 45 27	2698	63 8 45	2712
	Antares	E.	113 23 44	2708	111 47 15	2721	110 11 3	2734	108 35 9	2748
7	Sun	W.	41 47 7	3153	43 14 12	3167	44 41 1	3179	46 7 35	3193
	Spica	E.	55 9 52	2789	53 35 0	2795	52 0 26	2809	50 26 10	2822
	Antares	E.	100 40 5	2815	99 5 57	2828	97 32 6	2841	95 58 32	2855
8	Sun	W.	53 16 35	3255	54 41 39	3268	56 6 28	3279	57 31 4	3291
	Spica	E.	42 38 58	2884	41 6 19	2896	39 33 55	2908	38 1 46	2919
	Antares	E.	88 14 48	2916	86 42 50	2928	85 11 7	2940	83 39 39	2952
9	Sun	W.	64 30 50	3344	65 54 11	3352	67 17 22	3362	68 40 22	3370
	Regulus	W.	23 57 31	3074	25 26 12	3073	26 54 55	3072	28 23 39	3073
	Spica	E.	30 24 24	2969	28 53 33	2978	27 22 53	2987	25 52 24	2996
	Antares	E.	76 5 46	3003	74 35 37	3013	73 5 40	3022	71 35 55	3032
10	Sun	W.	75 33 6	3407	76 55 14	3413	78 17 16	3419	79 39 11	3423
	Regulus	W.	35 46 59	3081	37 15 32	3082	38 44 3	3085	40 12 31	3087
	Antares	E.	64 9 47	3070	62 41 1	3077	61 12 23	3083	59 43 53	3090
11	Sun	W.	86 27 35	3441	87 49 5	3443	89 10 33	3445	90 31 59	3446
	Regulus	W.	47 34 18	3094	49 2 35	3094	50 30 52	3094	51 59 9	3094
	Antares	E.	52 23 6	3114	50 55 14	3119	49 27 27	3123	47 59 45	3127
	α Aquilæ	E.	103 31 22	3486	102 10 42	3483	100 49 59	3480	99 29 13	3478
12	Sun	W.	97 19 1	3444	98 40 28	3441	100 1 58	3439	101 23 30	3436
	Regulus	W.	59 20 47	3087	60 49 13	3084	62 17 42	3081	63 46 15	3077
	Antares	E.	40 42 19	3143	39 15 2	3146	37 47 48	3149	36 20 38	3153
	α Aquilæ	E.	92 44 40	3465	91 23 37	3462	90 2 31	3460	88 41 22	3458
13	Sun	W.	108 12 14	3414	109 34 15	3408	110 56 22	3401	112 18 37	3395
	Regulus	W.	71 10 16	3053	72 39 23	3047	74 8 37	3041	75 37 59	3034
	Antares	E.	29 6 13	3183	27 39 44	3193	26 13 26	3205	24 47 23	3221
	α Aquilæ	E.	81 54 58	3446	80 33 34	3444	79 12 7	3442	77 50 38	3441
14	Sun	W.	119 11 52	3356	120 34 59	3347	121 58 16	3338	123 21 43	3328
	Regulus	W.	83 7 3	2995	84 37 22	2986	86 7 52	2977	87 38 34	2968
	Spica	W.	29 16 55	2978	30 47 35	2969	32 18 27	2959	33 49 31	2950
	α Aquilæ	E.	71 2 53	3437	69 41 18	3437	68 19 43	3438	66 58 9	3439
	Fomalhaut	E.	100 33 51	3446	99 12 27	3433	97 50 48	3421	96 28 55	3408
15	Sun	W.	130 21 53	3277	131 46 31	3266	133 11 22	3255	134 36 26	3244
	Regulus	W.	95 15 8	2915	96 47 7	2905	98 19 20	2893	99 51 48	2882
	Spica	W.	41 27 56	2898	43 0 18	2887	44 32 54	2876	46 5 44	2863

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Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
15	α Aquilæ	E.	65° 36′ 37″	3441	64° 15′ 7″	3445	62° 53′ 41″	3448	61° 32′ 19″	3454
	Fomalhaut	E.	95 6 48	3397	93 44 28	3385	92 21 54	3373	90 59 7	3362
	α Pegasi	E.	112 24 55	3132	110 57 24	3118	109 29 36	3104	108 1 31	3090
16	Regulus	W.	101 24 30	2870	102 57 27	2858	104 30 40	2845	106 4 9	2834
	Spica	W.	47 38 50	2852	49 12 11	2839	50 45 48	2826	52 19 40	2814
	α Aquilæ	E.	54 47 23	3499	53 26 58	3515	52 6 50	3532	50 47 1	3551
	Fomalhaut	E.	84 2 6	3312	82 38 8	3302	81 13 59	3294	79 49 41	3286
	α Pegasi	E.	100 36 54	3022	99 7 8	3008	97 37 5	2994	96 6 45	2981
17	Regulus	W.	113 55 29	2772	115 30 34	2760	117 5 55	2747	118 41 33	2734
	Spica	W.	60 13 11	2750	61 48 44	2737	63 24 35	2724	65 0 43	2711
	α Aquilæ	E.	44 14 36	3708	42 57 57	3754	41 42 7	3807	40 27 12	3869
	Fomalhaut	E.	72 46 4	3956	71 21 1	3953	69 55 54	3950	68 30 44	3949
	α Pegasi	E.	88 30 57	2916	86 58 59	2903	85 26 44	2890	83 54 13	2879
18	Spica	W.	73 5 47	2644	74 43 42	2632	76 21 54	2618	78 0 24	2606
	Antares	W.	28 19 18	2787	29 54 3	2761	31 29 22	2736	33 5 14	2713
	Fomalhaut	E.	61 24 58	3961	60 0 1	3969	58 35 13	3979	57 10 37	3990
	α Pegasi	E.	76 7 53	2832	74 33 54	2819	72 59 42	2806	71 25 17	2793
	α Arietis	E.	119 29 20	2727	117 53 16	2711	116 16 51	2696	114 40 6	2681
19	Spica	W.	86 17 14	2543	87 57 27	2531	89 37 57	2519	91 18 44	2507
	Antares	W.	41 11 36	2617	42 50 8	2601	44 29 2	2585	46 8 18	2569
	Fomalhaut	E.	50 12 6	3395	48 49 44	3429	47 28 0	3465	46 6 58	3510
	α Pegasi	E.	63 30 24	2755	61 54 57	2750	60 19 24	2746	58 43 45	2742
	α Arietis	E.	106 31 25	2611	104 52 45	2598	103 13 47	2585	101 34 32	2572
20	Spica	W.	99 46 38	2452	101 28 59	2442	103 11 34	2432	104 54 23	2422
	Antares	W.	54 29 40	2501	56 10 52	2489	57 52 21	2477	59 34 6	2466
	Fomalhaut	E.	39 36 26	3849	38 22 14	3948	37 9 43	4060	35 59 8	4200
	α Pegasi	E.	50 44 53	2744	49 9 12	2750	47 33 38	2757	45 58 14	2766
	α Arietis	E.	93 14 6	2516	91 33 15	2505	89 52 9	2494	88 10 48	2485
21	Antares	W.	68 6 40	2415	69 49 53	2407	71 33 18	2399	73 16 54	2391
	α Aquilæ	W.	28 25 29	5209	29 19 44	4802	30 18 5	4523	31 20 10	4391
	α Pegasi	E.	38 5 43	2866	36 32 40	2899	35 0 20	2940	33 28 52	2988
	α Arietis	E.	79 40 56	2443	77 58 23	2437	76 15 41	2430	74 32 49	2424
	SATURN	E.	111 14 4	2408	109 30 41	2400	107 47 6	2392	106 3 20	2384
	MARS	E.	111 54 43	2601	110 15 50	2593	108 36 45	2585	106 57 29	2577
	Aldebaran	E.	112 48 41	2384	111 4 43	2376	109 20 34	2368	107 36 14	2361
22	Antares	W.	81 57 37	2357	83 42 14	2351	85 26 59	2346	87 11 51	2341
	α Aquilæ	W.	37 15 34	3620	38 33 47	3516	39 53 53	3425	41 15 41	3344
	α Arietis	E.	65 56 32	2400	64 12 58	2398	62 29 20	2395	60 45 38	2393
	SATURN	E.	97 22 0	2353	95 37 18	2347	93 52 27	2342	92 7 29	2337
	MARS	E.	98 38 39	2543	96 58 26	2538	95 18 5	2533	93 37 37	2527
	Aldebaran	E.	98 52 0	2328	97 6 42	2323	95 21 16	2318	93 35 43	2313
23	Antares	W.	95 57 50	2322	97 43 17	2319	99 28 48	2317	101 14 22	2315
	α Aquilæ	W.	48 25 8	3051	49 54 17	3009	51 24 19	2971	52 55 8	2938
	α Arietis	E.	52 6 49	2394	50 23 6	2397	48 39 27	2400	46 55 53	2405
	SATURN	E.	83 20 59	2317	81 35 25	2314	79 49 46	2311	78 4 3	2309

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
15	α Aquilæ	E.	60° 11′ 3″	3460	58° 49′ 54″	3467	57° 28′ 53″	3476	56° 8′ 2″	3487
	Fomalhaut	E.	89 36 7	3351	88 12 54	3340	86 49 29	3331	85 25 53	3321
	α Pegasi	E.	106 33 9	3076	105 4 30	3063	103 35 35	3049	102 6 23	3035
16	Regulus	W.	107 37 53	2821	109 11 53	2809	110 46 9	2797	112 20 41	2785
	Spica	W.	53 53 49	2802	55 28 14	2789	57 2 56	2776	58 37 55	2763
	α Aquilæ	E.	49 27 23	3575	48 8 31	3601	46 49 58	3632	45 31 58	3667
	Fomalhaut	E.	78 25 13	3279	77 0 37	3272	75 35 53	3266	74 11 2	3260
	α Pegasi	E.	94 36 9	2968	93 5 16	2954	91 34 6	2942	90 2 40	2928
17	Regulus	W.	120 17 28	2722	121 53 39	2709	123 30 7	2697	125 6 51	2685
	Spica	W.	66 37 8	2696	68 13 51	2684	69 50 52	2672	71 28 10	2657
	α Aquilæ	E.	39 13 21	3939	38 0 41	4021	36 49 22	4114	35 39 34	4222
	Fomalhaut	E.	67 5 33	3248	65 40 21	3249	64 15 10	3252	62 50 2	3255
	α Pegasi	E.	82 21 27	2866	80 48 25	2855	79 15 9	2844	77 41 38	2833
18	Spica	W.	79 39 11	2593	81 18 15	2580	82 57 37	2567	84 37 17	2555
	Antares	W.	34 41 36	2692	36 18 27	2672	37 55 45	2653	39 33 28	2635
	Fomalhaut	E.	55 46 14	3305	54 22 8	3322	52 58 22	3343	51 35 0	3367
	α Pegasi	E.	69 50 40	2784	68 15 51	2776	66 40 52	2769	65 5 43	2761
	α Arietis	E.	113 3 0	2666	111 25 35	2652	109 47 50	2638	108 9 47	2624
19	Spica	W.	92 59 47	2496	94 41 6	2484	96 22 41	2473	98 4 32	2462
	Antares	W.	47 47 55	2554	49 27 53	2540	51 8 10	2527	52 48 46	2514
	Fomalhaut	E.	44 46 45	3561	43 27 28	3618	42 9 13	3684	40 52 9	3761
	α Pegasi	E.	57 8 1	2740	55 32 14	2739	53 46 26	2739	52 20 38	2741
	α Arietis	E.	99 54 59	2560	98 15 9	2548	96 35 3	2538	94 54 42	2527
20	Spica	W.	106 37 26	2412	108 20 43	2403	110 4 13	2395	111 47 55	2387
	Antares	W.	61 16 7	2455	62 58 23	2445	64 40 54	2434	66 23 40	2424
	Fomalhaut	E.	34 50 42	4355	33 44 40	4536	32 41 20	4747	31 41 0	4995
	α Pegasi	E.	44 23 2	2779	42 48 7	2795	41 13 32	2814	39 39 22	2836
	α Arietis	E.	86 29 14	2477	84 47 28	2467	83 5 29	2459	81 23 18	2451
21	Antares	W.	75 0 42	2383	76 44 41	2376	78 28 50	2369	80 13 9	2363
	α Aquilæ	W.	32 25 39	4192	33 34 13	4019	34 45 33	3868	35 59 25	3736
	α Pegasi	E.	31 58 24	3046	30 29 8	3117	29 1 19	3203	27 35 13	3306
	α Arietis	E.	72 49 48	2418	71 6 39	2413	69 23 23	2408	67 40 0	2405
	Saturn	E.	104 19 23	2377	102 35 16	2371	100 51 0	2364	99 6 34	2359
	Mars	E.	105 18 2	2569	103 38 25	2563	101 58 40	2556	100 18 44	2549
	Aldebaran	E.	105 51 43	2354	104 7 2	2347	102 22 11	2340	100 37 10	2334
22	Antares	W.	88 56 51	2337	90 41 57	2332	92 27 10	2328	94 12 28	2326
	α Aquilæ	W.	42 39 1	3272	44 3 45	3207	45 29 46	3149	46 56 56	3098
	α Arietis	E.	59 1 54	2392	57 18 8	2391	55 34 21	2391	53 50 34	2393
	Saturn	E.	90 22 23	2333	88 37 11	2328	86 51 53	2324	85 6 29	2320
	Mars	E.	91 57 2	2522	90 16 20	2518	88 35 32	2514	86 54 38	2510
	Aldebaran	E.	91 50 3	2309	90 4 16	2304	88 18 23	2300	86 32 24	2297
23	Antares	W.	103 0 0	2313	104 45 40	2312	106 31 22	2311	108 17 5	2311
	α Aquilæ	W.	54 26 39	2907	55 58 49	2879	57 31 35	2853	59 4 54	2830
	α Arietis	E.	45 12 26	2411	43 29 7	2418	41 45 58	2426	40 3 1	2437
	Saturn	E.	76 18 17	2306	74 32 27	2305	72 46 35	2304	71 0 41	2303

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23	Mars E.	85° 13′ 39″	2507	83° 32′ 34″	2504	81° 51′ 22″	2501	80° 10′ 9″	2499
	Aldebaran E.	84 46 20	2293	83 0 11	2291	81 13 58	2288	79 27 41	2285
	Sun E.	136 16 25	2626	134 38 6	2621	132 59 39	2616	131 21 6	2612
24	Antares W.	110 2 49	2311	111 48 33	2311	113 34 17	2311	115 20 1	2311
	α Aquilæ W.	60 38 43	2810	62 12 58	2792	63 47 36	2776	65 22 35	2761
	α Arietis E.	38 20 19	2449	36 37 54	2464	34 55 50	2482	33 14 11	2502
	Saturn E.	69 14 44	2300	67 28 45	2300	65 42 45	2299	63 56 44	2298
	Aldebaran E.	70 35 32	2278	68 49 0	2277	67 2 27	2276	65 15 53	2276
	Mars E.	71 43 24	2490	70 1 57	2489	68 20 30	2489	66 39 1	2488
	Sun E.	123 7 8	2598	121 28 10	2596	119 49 10	2595	118 10 8	2593
25	α Aquilæ W.	73 21 45	2710	74 58 12	2703	76 34 48	2697	78 11 32	2693
	Fomalhaut W.	45 30 55	3240	46 56 17	3185	48 22 44	3137	49 50 9	3094
	α Pegasi W.	26 21 23	3232	27 46 54	3194	29 14 34	3035	30 44 3	2961
	Saturn E.	55 6 34	2300	53 20 34	2300	51 34 35	2300	49 48 36	2302
	Aldebaran E.	56 23 5	2279	54 36 34	2280	52 50 5	2281	51 3 38	2282
	Mars E.	58 11 34	2491	56 30 7	2492	54 48 40	2492	53 7 14	2494
	Sun E.	109 54 41	2593	108 15 36	2593	106 36 31	2593	104 57 27	2594
26	α Aquilæ W.	86 16 12	2685	87 53 12	2686	89 30 11	2688	91 7 7	2691
	Fomalhaut W.	57 18 45	2936	58 50 18	2915	60 22 18	2895	61 54 43	2877
	α Pegasi W.	38 30 54	2724	40 7 2	2694	41 43 50	2669	43 21 12	2647
	Saturn E.	40 59 12	2310	39 13 27	2312	37 27 45	2314	35 42 6	2317
	Aldebaran E.	42 12 1	2293	40 25 52	2297	38 39 48	2300	36 53 48	2303
	Mars E.	44 40 45	2504	42 59 37	2508	41 18 33	2511	39 37 34	2514
	Sun E.	96 42 30	2601	95 3 37	2604	93 24 47	2607	91 46 1	2610
27	Fomalhaut W.	69 41 40	2816	71 15 47	2808	72 50 4	2802	74 24 29	2796
	α Pegasi W.	51 34 18	2573	53 13 50	2564	54 53 34	2556	56 33 29	2550
	Saturn E.	26 54 47	2330	25 9 32	2333	23 24 21	2337	21 39 16	2341
	Aldebaran E.	28 5 17	2327	26 19 57	2334	24 34 47	2341	22 49 47	2349
	Mars E.	31 13 54	2535	29 33 28	2540	27 53 8	2547	26 12 57	2553
	Sun E.	83 33 5	2623	81 54 42	2626	80 16 23	2630	78 38 9	2635
28	Fomalhaut W.	82 17 45	2788	83 52 29	2788	85 27 12	2790	87 1 53	2793
	α Pegasi W.	64 54 54	2531	66 35 24	2530	68 15 56	2530	69 56 28	2530
	α Arietis W.	21 42 35	2811	23 16 48	2751	24 52 20	2703	26 28 56	2664
	Sun E.	70 28 22	2655	68 50 42	2660	67 13 9	2666	65 35 43	2670
29	Fomalhaut W.	94 53 58	2821	96 27 59	2828	98 1 50	2838	99 35 29	2848
	α Pegasi W.	78 18 53	2538	79 59 13	2541	81 39 29	2545	83 19 39	2549
	α Arietis W.	34 41 56	2561	36 21 45	2550	38 1 49	2542	39 42 4	2535
	Sun E.	57 30 17	2699	55 53 36	2705	54 17 3	2712	52 40 39	2719
30	Fomalhaut W.	107 20 0	2914	108 52 1	2931	110 23 40	2950	111 54 56	2969
	α Pegasi W.	91 38 53	2577	93 18 19	2584	94 57 36	2592	96 36 42	2599
	α Arietis W.	48 4 52	2534	49 45 32	2525	51 26 11	2526	53 6 48	2529
	Sun E.	44 41 5	2758	43 5 42	2767	41 30 31	2777	39 55 33	2787
31	α Pegasi W.	104 49 19	2646	106 27 11	2657	108 4 48	2669	109 42 10	2681
	α Arietis W.	61 28 50	2548	63 8 57	2553	64 48 57	2558	66 28 49	2565
	Sun E.	32 4 10	2845	30 30 41	2860	28 57 31	2876	27 24 41	2893

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	**Mars**	E.	78° 28′ 53″	2497	76° 47′ 35″	2494	75° 6′ 14″	2493	73° 24′ 50″	2491
	Aldebaran	E.	77 41 20	2283	75 54 56	2282	74 8 30	2281	72 22 2	2279
	Sun	E.	129 42 27	2608	128 3 43	2605	126 24 55	2602	124 46 3	2600
24	Antares	W.	117 5 44	2313	118 51 25	2315	120 37 3	2316	122 22 39	2318
	α Aquilæ	W.	66 57 54	2748	68 33 30	2736	70 9 22	2725	71 45 28	2717
	α Arietis	E.	31 33 0	2526	29 52 23	2556	28 12 27	2591	26 33 20	2634
	Saturn	E.	62 10 42	2298	60 24 39	2298	58 38 37	2298	56 52 35	2299
	Aldebaran	E.	63 29 19	2276	61 42 45	2277	59 56 11	2277	58 9 37	2278
	Mars	E.	64 57 31	2488	63 16 1	2489	61 34 32	2489	59 53 3	2489
	Sun	E.	116 31 4	2593	114 51 59	2592	113 12 53	2592	111 33 47	2592
25	α Aquilæ	W.	79 48 21	2690	81 25 14	2687	83 2 11	2685	84 39 11	2684
	Fomalhaut	W.	51 18 26	3055	52 47 31	3021	54 17 18	2989	55 47 44	2961
	α Pegasi	W.	32 15 5	2898	33 47 27	2843	35 20 59	2797	36 55 31	2758
	Saturn	E.	48 2 39	2303	46 16 44	2304	44 30 51	2306	42 45 0	2308
	Aldebaran	E.	49 17 12	2284	47 30 49	2287	45 44 30	2289	43 58 14	2291
	Mars	E.	51 25 51	2496	49 44 30	2497	48 3 12	2499	46 21 57	2502
	Sun	E.	103 18 24	2595	101 39 23	2596	100 0 23	2598	98 21 25	2600
26	α Aquilæ	W.	92 43 59	2695	94 20 46	2698	95 57 28	2704	97 34 2	2710
	Fomalhaut	W.	63 27 31	2862	65 0 39	2848	66 34 4	2836	68 7 45	2825
	α Pegasi	W.	44 59 3	2627	46 37 21	2611	48 16 1	2596	49 55 1	2584
	Saturn	E.	33 56 31	2319	32 10 59	2322	30 25 31	2324	28 40 7	2327
	Aldebaran	E.	35 7 53	2307	33 22 4	2311	31 36 21	2316	29 50 45	2322
	Mars	E.	37 56 38	2517	36 15 48	2522	34 35 4	2526	32 54 25	2530
	Sun	E.	90 7 19	2612	88 28 40	2614	86 50 4	2617	85 11 32	2621
27	Fomalhaut	W.	75 59 0	2793	77 33 37	2790	79 8 18	2788	80 43 1	2788
	α Pegasi	W.	58 13 33	2544	59 53 45	2539	61 34 4	2536	63 14 27	2533
	Saturn	E.	19 54 16	2345	18 9 22	2348	16 24 33	2353	14 39 51	2359
	Aldebaran	E.	21 4 59	2359	19 20 26	2372	17 36 11	2388	15 52 19	2408
	Mars	E.	24 32 51	2561	22 52 57	2569	21 13 18	2580	19 33 53	2594
	Sun	E.	77 0 1	2638	75 21 58	2642	73 44 0	2646	72 6 8	2651
28	Fomalhaut	W.	88 36 30	2797	90 11 2	2801	91 45 28	2807	93 19 47	2813
	α Pegasi	W.	71 37 0	2530	73 17 31	2531	74 58 1	2533	76 38 29	2535
	α Arietis	W.	28 6 24	2634	29 44 33	2610	31 23 15	2589	33 2 25	2574
	Sun	E.	63 58 23	2675	62 21 10	2681	60 44 5	2686	59 7 7	2692
29	Fomalhaut	W.	101 8 54	2859	102 42 5	2871	104 15 1	2884	105 47 40	2899
	α Pegasi	W.	84 59 44	2554	86 39 42	2558	88 19 34	2564	89 59 18	2571
	α Arietis	W.	41 22 28	2530	43 2 59	2527	44 43 34	2525	46 24 12	2524
	Sun	E.	51 4 24	2726	49 28 19	2734	47 52 24	2741	46 16 39	2750
30	Fomalhaut	W.	113 25 48	2989	114 56 14	3013	116 26 11	3037	117 55 38	3063
	α Pegasi	W.	98 15 38	2608	99 54 22	2617	101 32 54	2626	103 11 13	2636
	α Arietis	W.	54 47 21	2531	56 27 51	2535	58 8 16	2538	59 48 36	2543
	Sun	E.	38 20 48	2797	36 46 16	2808	35 11 58	2820	33 37 56	2832
31	α Pegasi	W.	111 19 15	2694	112 56 3	2707	114 32 33	2722	116 8 44	2737
	α Arietis	W.	68 8 32	2572	69 48 6	2578	71 27 31	2585	73 6 46	2593
	Sun	E.	25 52 13	2912	24 20 9	2933	22 48 32	2957	21 17 25	2985

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	8 45 7.73	9.717	N.18 3 21.4	-37.70	15 48.00	66.66	6 6.13	0.140
Thur.	2	8 49 0.62	9.692	17 48 7.5	38.44	15 48.13	66.57	6 2.49	0.165
Frid.	3	8 52 52.91	9.667	17 32 36.3	39.15	15 48.26	66.48	5 58.24	0.190
Sat.	4	8 56 44.60	9.641	17 16 47.9	-39.86	15 48.39	66.39	5 53.38	0.216
Sun.	5	9 0 35.68	9.616	17 0 42.7	40.55	15 48.53	66.30	5 47.92	0.241
Mon.	6	9 4 26.15	9.591	16 44 21.2	41.24	15 48.68	66.22	5 41.86	0.266
Tues.	7	9 8 16.02	9.565	16 27 43.5	-41.91	15 48.83	66.13	5 35.19	0.291
Wed.	8	9 12 5.29	9.540	16 10 49.7	42.57	15 48.99	66.05	5 27.92	0.316
Thur.	9	9 15 53.95	9.515	15 53 40.4	43.20	15 49.15	65.96	5 20.05	0.341
Frid.	10	9 19 42.01	9.490	15 36 16.0	-43.83	15 49.31	65.88	5 11.58	0.366
Sat.	11	9 23 29.50	9.466	15 18 36 7	44.45	15 49.48	65.80	5 2.53	0.390
Sun.	12	9 27 16.40	9.442	15 0 42.7	45.05	15 49.65	65.72	4 52.90	0.414
Mon.	13	9 31 2.71	9.418	14 42 34.3	-45.64	15 49.83	65.64	4 42.68	0.438
Tues.	14	9 34 48.45	9.395	14 24 12.0	46.22	15 50.01	65.56	4 31.90	0.461
Wed.	15	9 38 33.64	9.372	14 5 36.0	46.78	15 50.19	65.48	4 20.56	0.484
Thur.	16	9 42 18.29	9.350	13 46 46.6	-47.33	15 50.37	65.40	4 8.68	0.506
Frid.	17	9 46 2.41	9.328	13 27 44.1	47.87	15 50.55	65.32	3 56.28	0.528
Sat.	18	9 49 46.00	9.307	13 8 28.6	48.40	15 50.74	65.25	3 43.37	0.550
Sun.	19	9 53 29.10	9.286	12 49 0.6	-48.92	15 50.93	65.17	3 29.95	0.570
Mon.	20	9 57 11.72	9.266	12 29 20.5	49.43	15 51.12	65.10	3 16.05	0.590
Tues.	21	10 0 53.87	9.247	12 9 28.5	49.92	15 51.31	65.03	3 1.68	0.609
Wed.	22	10 4 35.56	9.228	11 49 24.7	-50.39	15 51.51	64.97	2 46.86	0.627
Thur.	23	10 8 16.82	9.210	11 29 9.6	50.85	15 51.71	64.90	2 31.61	0.645
Frid.	24	10 11 57.66	9.192	11 8 43.5	51.31	15 51.91	64.84	2 15.94	0.663
Sat.	25	10 15 38.09	9.176	10 48 6.7	-51.75	15 52.11	64.78	1 59.86	0.679
Sun.	26	10 19 18.13	9.160	10 27 19.6	52.17	15 52.32	64.72	1 43.39	0.695
Mon.	27	10 22 57.78	9.145	10 6 22.4	52.59	15 52.53	64.66	1 26.54	0.710
Tues.	28	10 26 37.06	9.130	9 45 15.5	-52.98	15 52.74	64.61	1 9.33	0.725
Wed.	29	10 30 16.00	9.116	9 23 59.2	53.36	15 52.95	64.56	0 51.77	0.739
Thur.	30	10 33 54.62	9.102	9 2 34.0	53.72	15 53.17	64.51	0 33.88	0.753
Frid.	31	10 37 32.92	9.089	8 41 0.0	54.08	15 53.39	64.46	0 15.67	0.766
Sat.	32	10 41 10.90	9.076	N. 8 19 17.6	-54.42	15 53.62	64.41	0 2.85	0.779

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.
The sign – prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	8 45 6.74	9.717	N. 18 3 25.2	−37.70	6 6.14	0.140	8 39 0.60
Thur.	2	8 48 59.65	9.692	17 48 11.4	38.44	6 2.50	0.165	8 42 57.15
Frid.	3	8 52 51.96	9.667	17 32 40.2	39.15	5 58.25	0.190	8 46 53.71
Sat.	4	8 56 43.66	9.641	17 16 51.8	−39.86	5 53.40	0.216	8 50 50.26
Sun.	5	9 0 34.76	9.616	17 0 46.6	40.55	5 47.94	0.241	8 54 46.82
Mon.	6	9 4 25.25	9.591	16 44 25.1	41.24	5 41.88	0.266	8 58 43.37
Tues.	7	9 8 15.14	9.566	16 27 47.4	−41.91	5 35.21	0.291	9 2 39.93
Wed.	8	9 12 4.43	9.541	16 10 53.6	42.57	5 27.95	0.316	9 6 36.48
Thur.	9	9 15 53.11	9.516	15 53 44.3	43.20	5 20.07	0.341	9 10 33.04
Frid.	10	9 19 41.20	9.491	15 36 19.9	−43.83	5 11.61	0.366	9 14 29.59
Sat.	11	9 23 28.71	9.467	15 18 40.5	44.45	5 2.56	0.390	9 18 26.15
Sun.	12	9 27 15.63	9.443	15 0 46.4	45.05	4 52.93	0.414	9 22 22.70
Mon.	13	9 31 1.97	9.419	14 42 37.9	−45.64	4 42.71	0.438	9 26 19.26
Tues.	14	9 34 47.74	9.396	14 24 15.5	46.22	4 31.93	0.461	9 30 15.81
Wed.	15	9 38 32.96	9.373	14 5 39.4	46.78	4 20.59	0.484	9 34 12.37
Thur.	16	9 42 17.64	9.351	13 46 49.9	−47.33	4 8.72	0.506	9 38 8.92
Frid.	17	9 46 1.79	9.328	13 27 47.3	47.88	3 56.31	0.528	9 42 5.48
Sat.	18	9 49 45.42	9.307	13 8 31.7	48.41	3 43.40	0.550	9 46 2.03
Sun.	19	9 53 28.55	9.287	12 49 3.5	−48.93	3 29.97	0.570	9 49 58.58
Mon.	20	9 57 11.21	9.267	12 29 23.2	49.44	3 16.08	0.590	9 53 55.13
Tues.	21	10 0 53.40	9.248	12 9 31.0	49.93	3 1.71	0.609	9 57 51.69
Wed.	22	10 4 35.13	9.230	11 49 27.0	−50.40	2 46.89	0.627	10 1 48.24
Thur.	23	10 8 16.43	9.212	11 29 11.7	50.86	2 31.64	0.645	10 5 44.79
Frid.	24	10 11 57.31	9.194	11 8 45.4	51.32	2 15.97	0.663	10 9 41.34
Sat.	25	10 15 37.78	9.178	10 48 8.4	−51.76	1 59.88	0.679	10 13 37.90
Sun.	26	10 19 17.86	9.162	10 27 21.1	52.18	1 43.41	0.695	10 17 34.45
Mon.	27	10 22 57.56	9.147	10 6 23.7	52.60	1 26.56	0.710	10 21 31.00
Tues.	28	10 26 36.89	9.132	9 45 16.5	−52.99	1 9.34	0.725	10 25 27.55
Wed.	29	10 30 15.88	9.118	9 24 0.0	53.37	0 51.77	0.739	10 29 24.11
Thur.	30	10 33 54.54	9.104	9 2 34.5	53.73	0 33.88	0.753	10 33 20.66
Frid.	31	10 37 32.88	9.091	8 41 0.2	54.09	0 15.67	0.766	10 37 17.21
Sat.	32	10 41 10.91	9.078	N. 8 19 17.6	−54.43	0 2.85	0.779	10 41 13.76

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
+ $9^s.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	213	128 51 4.0	50 22.8	143.60	– 0.72	0.0063659	– 23.5	15 18 28.52
2	214	129 48 31.2	47 49.9	143.65	0.76	0.0063084	24.5	15 14 32.61
3	215	130 45 59.4	45 18.1	143.69	0.77	0.0062485	25.4	15 10 36.70
4	216	131 43 28.6	42 47.1	143.73	– 0.74	0.0061862	– 26.4	15 6 40.79
5	217	132 40 58.7	40 17.0	143.77	0.68	0.0061216	27.4	15 2 44.88
6	218	133 38 29.8	37 48.0	143.81	0.60	0.0060546	28.4	14 58 48.97
7	219	134 36 1.8	35 19.9	143.85	– 0.50	0.0059854	– 29.3	14 54 53.07
8	220	135 33 34.7	32 52.7	143.88	0.38	0.0059140	30.2	14 50 57.16
9	221	136 31 8.4	30 26.2	143.92	0.26	0.0058406	31.0	14 47 1.25
10	222	137 28 42.9	28 0.6	143.96	– 0.13	0.0057654	– 31.7	14 43 5.33
11	223	138 26 18.3	25 35.9	144.00	0.00	0.0056885	32.4	14 39 9.43
12	224	139 23 54.7	23 12.2	144.04	+ 0.12	0.0056099	33.0	14 35 13.52
13	225	140 21 32.0	20 49.4	144.08	+ 0.21	0.0055299	– 33.6	14 31 17.61
14	226	141 19 10.3	18 27.6	144.12	0.28	0.0054486	34.1	14 27 21.70
15	227	142 16 49.7	16 6.9	144.16	0.33	0.0053662	34.6	14 23 25.79
16	228	143 14 30.1	13 47.2	144.21	+ 0.34	0.0052827	– 35.0	14 19 29.88
17	229	144 12 11.8	11 28.8	144.26	0.33	0.0051983	35.4	14 15 33.97
18	230	145 9 54.8	9 11.7	144.32	0.29	0.0051129	35.8	14 11 38.07
19	231	146 7 39.2	6 55.9	144.38	+ 0.20	0.0050266	– 36.1	14 7 42.17
20	232	147 5 25.1	4 41.7	144.44	+ 0.11	0.0049394	36.5	14 3 46.26
21	233	148 3 12.6	2 29.1	144.51	– 0.01	0.0048513	36.9	13 59 50.35
22	234	149 1 1.6	0 18.0	144.58	– 0.13	0.0047622	– 37.4	13 55 54.44
23	235	149 58 52.3	58 8.6	144.65	0.26	0.0046720	37.8	13 51 58.54
24	236	150 56 44.7	56 0.9	144.73	0.39	0.0045807	38.3	13 48 2.63
25	237	151 54 38.9	53 55.0	144.80	– 0.52	0.0044882	– 38.8	13 44 6.72
26	238	152 52 35.0	51 51.0	144.88	0.63	0.0043944	39.4	13 40 10.82
27	239	153 50 32.9	49 48.8	144.95	0.74	0.0042991	40.0	13 36 14.92
28	240	154 48 32.7	47 48.5	145.03	– 0.80	0.0042023	– 40.7	13 32 19.01
29	241	155 46 34.3	45 50.0	145.10	0.84	0.0041039	41.3	13 28 23.10
30	242	156 44 37.7	43 53.3	145.17	0.85	0.0040039	42.0	13 24 27.19
31	243	157 42 42.9	41 58.4	145.24	0.82	0.0039022	42.7	13 20 31.29
32	244	158 40 49.9	40 5.3	145.32	– 0.78	0.0037987	– 43.5	13 16 35.38

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 41.4	15 37.1	57 28.0	−1.27	57 12.4	−1.32	23 32.4	2.12	27.9
2	15 32.7	15 28.2	56 56.3	1.36	56 39.7	1.39	δ		28.9
3	15 23.6	15 19.1	56 22.9	1.40	56 6.1	1.39	0 21.9	2.01	0.4
4	15 14.6	15 10.2	55 49.6	−1.36	55 33.6	−1.31	1 9.0	1.91	1.4
5	15 6.1	15 2.2	55 18.3	1.22	55 4.2	1.12	1 54.0	1.84	2.4
6	14 58.7	14 55.6	54 51.3	1.02	54 39.9	0.87	2 37.6	1.80	3.4
7	14 53.0	14 50.9	54 30.3	−0.72	54 22.6	−0.55	3 20.5	1.78	4.4
8	14 49.4	14 48.5	54 17.1	−0.37	54 13.8	−0.17	4 3.5	1.80	5.4
9	14 48.3	14 48.7	54 13.0	+0.03	54 14.6	+0.24	4 47.1	1.84	6.4
10	14 49.8	14 51.7	54 18.8	+0.46	54 25.6	+0.67	5 32.0	1.91	7.4
11	14 54.2	14 57.5	54 34.9	0.88	54 46.8	1.09	6 18.6	1.98	8.4
12	15 1.3	15 5.8	55 1.0	1.27	55 17.5	1.46	7 7.1	2.06	9.4
13	15 10.9	15 16.4	55 36.1	+1.62	55 56.4	+1.76	7 57.4	2.13	10.4
14	15 22.4	15 28.6	56 18.3	1.87	56 41.3	1.94	8 49.2	2.19	11.4
15	15 35.1	15 41.7	57 5.0	1.99	57 29.1	2.00	9 42.1	2.22	12.4
16	15 48.2	15 54.5	57 53.0	+1.97	58 16.2	+1.88	10 35.4	2.22	13.4
17	16 0.5	16 6.0	58 38.3	1.77	58 58.6	1.61	11 28.7	2.21	14.4
18	16 11.0	16 15.3	59 16.9	1.42	59 32.6	1.19	12 21.7	2.20	15.4
19	16 18.8	16 21.5	59 45.5	+0.95	59 55.3	+0.68	13 14.6	2.20	16.4
20	16 23.3	16 24.2	60 1.9	+0.42	60 5.3	+0.15	14 7.7	2.22	17.4
21	16 24.3	16 23.6	60 5.6	−0.11	60 3.0	−0.33	15 1.4	2.26	18.4
22	16 22.1	16 20.0	59 57.6	−0.55	59 49.9	−0.73	15 56.0	2.30	19.4
23	16 17.3	16 14.2	59 40.0	0.89	59 28.5	1.02	16 51.7	2.34	20.4
24	16 10.6	16 6.8	59 15.5	1.12	59 1.4	1.20	17 48.2	2.36	21.4
25	16 2.8	15 58.6	58 46.6	−1.26	58 31.2	−1.30	18 44.8	2.35	22.4
26	15 54.3	15 50.0	58 15.5	1.32	57 59.6	1.32	19 40.7	2.30	23.4
27	15 45.6	15 41.3	57 43.7	1.32	57 27.8	1.32	20 34.9	2.22	24.4
28	15 37.0	15 32.8	57 12.1	−1.31	56 56.5	−1.29	21 27.0	2.12	25.4
29	15 28.6	15 24.5	56 41.1	1.27	56 26.0	1.24	22 16.6	2.02	26.4
30	15 20.4	15 16.5	56 11.2	1.22	55 56.7	1.19	23 3.9	1.93	27.4
31	15 12.6	15 8.9	55 42.5	1.16	55 28.9	1.11	23 49.2	1.86	28.4
32	15 5.4	15 2.0	55 15.8	−1.07	55 3.3	−1.01	δ		29.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
		WEDNESDAY 1.					FRIDAY 3.		
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 22 5.62	2.3085	N.17 16 23.1	5.549	0	9 8 8.01	2.1093	N.11 18 32.0	8.986
1	7 24 24.01	2.3046	17 10 47.3	5.642	1	9 10 14.45	2.1054	11 9 31.4	9.033
2	7 26 42.17	2.3007	17 5 6.0	5.735	2	9 12 20.66	2.1015	11 0 28.0	9.080
3	7 29 0.09	2.2967	16 59 19.1	5.827	3	9 14 26.63	2.0976	10 51 21.8	9.126
4	7 31 17.77	2.2927	16 53 26.7	5.919	4	9 16 32.37	2.0937	10 42 12.9	9.170
5	7 33 35.21	2.2887	16 47 28.8	6.010	5	9 18 37.87	2.0898	10 33 1.4	9.214
6	7 35 52.41	2.2847	16 41 25.5	6.099	6	9 20 43.14	2.0859	10 23 47.3	9.257
7	7 38 9.37	2.2806	16 35 16.9	6.188	7	9 22 48.18	2.0822	10 14 30.6	9.298
8	7 40 26.08	2.2764	16 29 2.9	6.277	8	9 24 53.00	2.0784	10 5 11.5	9.338
9	7 42 42.54	2.2723	16 22 43.7	6.364	9	9 26 57.59	2.0746	9 55 50.0	9.378
10	7 44 58.75	2.2682	16 16 19.4	6.449	10	9 29 1.95	2.0708	9 46 26.1	9.418
11	7 47 14.72	2.2641	16 9 49.9	6.534	11	9 31 6.09	2.0672	9 36 59.8	9.457
12	7 49 30.44	2.2599	16 3 15.3	6.618	12	9 33 10.01	2.0635	9 27 31.3	9.493
13	7 51 45.91	2.2557	15 56 35.7	6.701	13	9 35 13.71	2.0598	9 18 0.6	9.529
14	7 54 1.13	2.2516	15 49 51.2	6.782	14	9 37 17.19	2.0562	9 8 27.8	9.564
15	7 56 16.10	2.2473	15 43 1.8	6.863	15	9 39 20.46	2.0527	8 58 52.9	9.598
16	7 58 30.81	2.2431	15 36 7.6	6.944	16	9 41 23.51	2.0491	8 49 16.0	9.632
17	8 0 45.27	2.2389	15 29 8.5	7.024	17	9 43 26.35	2.0456	8 39 37.1	9.665
18	8 2 59.48	2.2347	15 22 4.7	7.102	18	9 45 28.98	2.0421	8 29 56.2	9.697
19	8 5 13.44	2.2305	15 14 56.3	7.179	19	9 47 31.40	2.0387	8 20 13.5	9.727
20	8 7 27.14	2.2262	15 7 43.3	7.255	20	9 49 33.62	2.0352	8 10 29.0	9.757
21	8 9 40.59	2.2220	15 0 25.7	7.331	21	9 51 35.63	2.0318	8 0 42.7	9.786
22	8 11 53.78	2.2177	14 53 3.6	7.404	22	9 53 37.44	2.0285	7 50 54.7	9.814
23	8 14 6.72	2.2135	N.14 45 37.2	7.477	23	9 55 39.05	2.0252	N. 7 41 5.0	9.842
		THURSDAY 2.					SATURDAY 4.		
0	8 16 19.40	2.2092	N.14 38 6.4	7.549	0	9 57 40.47	2.0220	N. 7 31 13.7	9.868
1	8 18 31.83	2.2050	14 30 31.3	7.621	1	9 59 41.69	2.0187	7 21 20.9	9.893
2	8 20 44.00	2.2007	14 22 51.9	7.692	2	10 1 42.72	2.0155	7 11 26.6	9.918
3	8 22 55.92	2.1965	14 15 8.3	7.761	3	10 3 43.55	2.0123	7 1 30.8	9.942
4	8 25 7.58	2.1922	14 7 20.6	7.829	4	10 5 44.19	2.0092	6 51 33.6	9.964
5	8 27 18.99	2.1880	13 59 28.8	7.897	5	10 7 44.65	2.0062	6 41 35.1	9.986
6	8 29 30.14	2.1837	13 51 33.0	7.963	6	10 9 44.93	2.0031	6 31 35.3	10.007
7	8 31 41.04	2.1795	13 43 33.3	8.028	7	10 11 45.02	2.0001	6 21 34.2	10.027
8	8 33 51.68	2.1753	13 35 29.7	8.093	8	10 13 44.94	1.9972	6 11 32.0	10.047
9	8 36 2.07	2.1711	13 27 22.2	8.156	9	10 15 44.68	1.9942	6 1 28.6	10.066
10	8 38 12.21	2.1669	13 19 11.0	8.217	10	10 17 44.24	1.9913	5 51 24.1	10.083
11	8 40 22.10	2.1627	13 10 56.1	8.278	11	10 19 43.63	1.9884	5 41 18.6	10.100
12	8 42 31.73	2.1584	13 2 37.6	8.338	12	10 21 42.85	1.9856	5 31 12.1	10.117
13	8 44 41.11	2.1542	12 54 15.6	8.398	13	10 23 41.90	1.9828	5 21 4.6	10.132
14	8 46 50.24	2.1501	12 45 49.9	8.457	14	10 25 40.79	1.9801	5 10 56.2	10.147
15	8 48 59.12	2.1460	12 37 20.7	8.515	15	10 27 39.51	1.9774	5 0 47.0	10.160
16	8 51 7.76	2.1419	12 28 48.1	8.571	16	10 29 38.08	1.9748	4 50 37.0	10.173
17	8 53 16.15	2.1377	12 20 12.2	8.626	17	10 31 36.49	1.9722	4 40 26.2	10.186
18	8 55 24.29	2.1336	12 11 33.0	8.680	18	10 33 34.74	1.9696	4 30 14.7	10.197
19	8 57 32.18	2.1295	12 2 50.6	8.733	19	10 35 32.84	1.9671	4 20 2.5	10.208
20	8 59 39.83	2.1255	11 54 5.0	8.786	20	10 37 30.79	1.9647	4 9 49.7	10.218
21	9 1 47.24	2.1215	11 45 16.3	8.837	21	10 39 28.60	1.9622	3 59 36.4	10.227
22	9 3 54.41	2.1174	11 36 24.5	8.888	22	10 41 26.26	1.9598	3 49 22.5	10.236
23	9 6 1.33	2.1133	11 27 29.7	8.937	23	10 43 23.78	1.9574	3 39 8.1	10.243
24	9 8 8.01	2.1093	N.11 18 32.0	8.986	24	10 45 21.15	1.9551	N. 3 28 53.3	10.250

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 45 21.15	1.9551	N. 3 28 53.3	10.250
1	10 47 18.39	1.9529	3 18 38.1	10.256
2	10 49 15.50	1.9507	3 8 22.6	10.262
3	10 51 12.47	1.9485	2 58 6.7	10.267
4	10 53 9.32	1.9464	2 47 50.6	10.270
5	10 55 6.04	1.9443	2 37 34.3	10.273
6	10 57 2.63	1.9422	2 27 17.8	10.276
7	10 58 59.10	1.9402	2 17 1.2	10.277
8	11 0 55.45	1.9382	2 6 44.5	10.278
9	11 2 51.69	1.9363	1 56 27.8	10.278
10	11 4 47.81	1.9345	1 46 11.1	10.278
11	11 6 43.83	1.9327	1 35 54.4	10.277
12	11 8 39.74	1.9309	1 25 37.8	10.276
13	11 10 35.54	1.9292	1 15 21.3	10.273
14	11 12 31.24	1.9275	1 5 5.0	10.270
15	11 14 26.84	1.9258	0 54 48.9	10.266
16	11 16 22.34	1.9242	0 44 33.1	10.261
17	11 18 17.75	1.9227	0 34 17.6	10.257
18	11 20 13.07	1.9212	0 24 2.3	10.251
19	11 22 8.30	1.9197	0 13 47.4	10.244
20	11 24 3.44	1.9183	N. 0 3 33.0	10.237
21	11 25 58.50	1.9170	S. 0 6 41.0	10.229
22	11 27 53.48	1.9157	0 16 54.5	10.221
23	11 29 48.38	1.9144	S. 0 27 7.5	10.212

MONDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 31 43.21	1.9132	S. 0 37 19.9	10.202
1	11 33 37.97	1.9120	0 47 31.7	10.192
2	11 35 32.65	1.9108	0 57 42.9	10.181
3	11 37 27.26	1.9097	1 7 53.4	10.169
4	11 39 21.81	1.9087	1 18 3.2	10.157
5	11 41 16.30	1.9077	1 28 12.2	10.144
6	11 43 10.74	1.9068	1 38 20.5	10.131
7	11 45 5.12	1.9059	1 48 27.9	10.116
8	11 46 59.45	1.9050	1 58 34.4	10.101
9	11 48 53.72	1.9042	2 8 40.0	10.086
10	11 50 47.95	1.9034	2 18 44.7	10.071
11	11 52 42.13	1.9027	2 28 48.5	10.055
12	11 54 36.27	1.9020	2 38 51.3	10.037
13	11 56 30.37	1.9014	2 48 53.0	10.019
14	11 58 24.44	1.9008	2 58 53.6	10.001
15	12 0 18.47	1.9002	3 8 53.1	9.982
16	12 2 12.47	1.8997	3 18 51.4	9.963
17	12 4 6.44	1.8992	3 28 48.6	9.943
18	12 6 0.38	1.8988	3 38 44.6	9.922
19	12 7 54.30	1.8985	3 48 39.3	9.901
20	12 9 48.20	1.8982	3 58 32.7	9.878
21	12 11 42.08	1.8979	4 8 24.7	9.856
22	12 13 35.95	1.8977	4 18 15.4	9.833
23	12 15 29.81	1.8975	4 28 4.7	9.810
24	12 17 23.65	1.8973	S. 4 37 52.6	9.786

TUESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 17 23.65	1.8973	S. 4 37 52.6	9.786
1	12 19 17.49	1.8973	4 47 39.0	9.761
2	12 21 11.33	1.8972	4 57 23.9	9.736
3	12 23 5.16	1.8972	5 7 7.3	9.711
4	12 24 59.00	1.8973	5 16 49.2	9.685
5	12 26 52.84	1.8973	5 26 29.5	9.657
6	12 28 46.68	1.8974	5 36 8.1	9.629
7	12 30 40.53	1.8977	5 45 45.0	9.601
8	12 32 34.40	1.8979	5 55 20.2	9.572
9	12 34 28.28	1.8982	6 4 53.7	9.544
10	12 36 22.16	1.8985	6 14 25.5	9.515
11	12 38 16.10	1.8988	6 23 55.5	9.484
12	12 40 10.04	1.8992	6 33 23.6	9.453
13	12 42 4.01	1.8997	6 42 49.9	9.422
14	12 43 58.00	1.9001	6 52 14.3	9.391
15	12 45 52.02	1.9006	7 1 36.8	9.358
16	12 47 46.07	1.9012	7 10 57.3	9.325
17	12 49 40.16	1.9018	7 20 15.8	9.292
18	12 51 34.29	1.9025	7 29 32.3	9.258
19	12 53 28.46	1.9032	7 38 46.7	9.223
20	12 55 22.67	1.9039	7 47 59.1	9.189
21	12 57 16.93	1.9047	7 57 9.4	9.153
22	12 59 11.23	1.9055	8 6 17.5	9.118
23	13 1 5.59	1.9064	S. 8 15 23.5	9.082

WEDNESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 3 0.00	1.9073	S. 8 24 27.3	9.044
1	13 4 54.47	1.9082	8 33 28.8	9.006
2	13 6 48.99	1.9092	8 42 28.0	8.968
3	13 8 43.57	1.9102	8 51 25.0	8.931
4	13 10 38.21	1.9113	9 0 19.7	8.892
5	13 12 32.92	1.9124	9 9 12.0	8.851
6	13 14 27.70	1.9136	9 18 1.8	8.810
7	13 16 22.55	1.9147	9 26 49.2	8.770
8	13 18 17.47	1.9159	9 35 34.2	8.729
9	13 20 12.46	1.9172	9 44 16.7	8.687
10	13 22 7.53	1.9185	9 52 56.7	8.645
11	13 24 2.68	1.9199	10 1 34.1	8.602
12	13 25 57.92	1.9213	10 10 8.9	8.558
13	13 27 53.24	1.9227	10 18 41.1	8.515
14	13 29 48.64	1.9241	10 27 10.7	8.471
15	13 31 44.13	1.9256	10 35 37.6	8.426
16	13 33 39.71	1.9272	10 44 1.8	8.380
17	13 35 35.39	1.9287	10 52 23.2	8.334
18	13 37 31.16	1.9303	11 0 41.9	8.288
19	13 39 27.03	1.9320	11 8 57.8	8.241
20	13 41 23.00	1.9337	11 17 10.8	8.193
21	13 43 19.07	1.9353	11 25 21.0	8.146
22	13 45 15.24	1.9371	11 33 28.3	8.098
23	13 47 11.52	1.9389	11 41 32.7	8.048
24	13 49 7.91	1.9407	S. 11 49 34.1	7.998

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 49 7.91	1.9407	S. 11 49 34.1	7.998
1	13 51 4.41	1.9426	11 57 32.5	7.948
2	13 53 1.02	1.9445	12 5 27.9	7.898
3	13 54 57.75	1.9464	12 13 20.3	7.847
4	13 56 54.59	1.9483	12 21 9.6	7.795
5	13 58 51.55	1.9503	12 28 55.7	7.743
6	14 0 48.63	1.9523	12 36 38.7	7.691
7	14 2 45.83	1.9544	12 44 18.6	7.637
8	14 4 43.16	1.9566	12 51 55.2	7.583
9	14 6 40.62	1.9587	12 59 28.6	7.529
10	14 8 38.20	1.9609	13 6 58.7	7.474
11	14 10 35.92	1.9631	13 14 25.5	7.419
12	14 12 33.77	1.9653	13 21 49.0	7.364
13	14 14 31.75	1.9675	13 29 9.2	7.307
14	14 16 29.87	1.9697	13 36 25.9	7.250
15	14 18 28.12	1.9720	13 43 39.2	7.192
16	14 20 26.51	1.9743	13 50 49.0	7.135
17	14 22 25.04	1.9767	13 57 55.4	7.077
18	14 24 23.72	1.9792	14 4 58.2	7.018
19	14 26 22.54	1.9816	14 11 57.5	6.958
20	14 28 21.51	1.9840	14 18 53.2	6.898
21	14 30 20.62	1.9864	14 25 45.3	6.837
22	14 32 19.88	1.9889	14 32 33.7	6.776
23	14 34 19.29	1.9914	S. 14 39 18.4	6.715

FRIDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 36 18.85	1.9940	S. 14 45 59.5	6.653
1	14 38 18.57	1.9966	14 52 36.8	6.590
2	14 40 18.44	1.9992	14 59 10.3	6.527
3	14 42 18.47	2.0018	15 5 40.0	6.463
4	14 44 18.66	2.0045	15 12 5.9	6.399
5	14 46 19.01	2.0072	15 18 27.9	6.334
6	14 48 19.51	2.0098	15 24 46.0	6.268
7	14 50 20.18	2.0125	15 31 0.1	6.203
8	14 52 21.01	2.0152	15 37 10.3	6.137
9	14 54 22.00	2.0179	15 43 16.5	6.069
10	14 56 23.16	2.0207	15 49 18.6	6.001
11	14 58 24.49	2.0236	15 55 16.6	5.934
12	15 0 25.99	2.0264	16 1 10.6	5.866
13	15 2 27.66	2.0292	16 7 0.5	5.796
14	15 4 29.50	2.0320	16 12 46.1	5.725
15	15 6 31.50	2.0348	16 18 27.5	5.655
16	15 8 33.68	2.0377	16 24 4.7	5.585
17	15 10 36.03	2.0406	16 29 37.7	5.514
18	15 12 38.55	2.0435	16 35 6.4	5.442
19	15 14 41.25	2.0465	16 40 30.7	5.369
20	15 16 44.13	2.0494	16 45 50.7	5.297
21	15 18 47.18	2.0523	16 51 6.3	5.223
22	15 20 50.41	2.0553	16 56 17.5	5.149
23	15 22 53.82	2.0582	17 1 24.2	5.074
24	15 24 57.40	2.0612	S. 17 6 26.4	4.999

SATURDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 24 57.40	2.0612	S. 17 6 26.4	4.999
1	15 27 1.16	2.0642	17 11 24.1	4.923
2	15 29 5.10	2.0672	17 16 17.2	4.847
3	15 31 9.22	2.0702	17 21 5.8	4.771
4	15 33 13.53	2.0733	17 25 49.7	4.694
5	15 35 18.02	2.0763	17 30 29.0	4.616
6	15 37 22.69	2.0792	17 35 3.6	4.537
7	15 39 27.54	2.0823	17 39 33.5	4.458
8	15 41 32.57	2.0854	17 43 58.6	4.379
9	15 43 37.79	2.0885	17 48 19.0	4.300
10	15 45 43.19	2.0915	17 52 34.6	4.219
11	15 47 48.77	2.0946	17 56 45.3	4.137
12	15 49 54.54	2.0977	18 0 51.1	4.056
13	15 52 0.49	2.1007	18 4 52.0	3.974
14	15 54 6.62	2.1037	18 8 48.0	3.892
15	15 56 12.94	2.1068	18 12 39.0	3.808
16	15 58 19.44	2.1098	18 16 25.0	3.725
17	16 0 26.12	2.1129	18 20 6.0	3.641
18	16 2 32.99	2.1160	18 23 41.9	3.556
19	16 4 40.04	2.1190	18 27 12.7	3.471
20	16 6 47.27	2.1221	18 30 38.4	3.385
21	16 8 54.69	2.1252	18 33 58.9	3.298
22	16 11 2.29	2.1282	18 37 14.2	3.211
23	16 13 10.07	2.1312	S. 18 40 24.3	3.124

SUNDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 15 18.04	2.1343	S. 18 43 29.1	3.037
1	16 17 26.19	2.1373	18 46 28.7	2.949
2	16 19 34.52	2.1403	18 49 23.0	2.860
3	16 21 43.02	2.1433	18 52 11.9	2.770
4	16 23 51.71	2.1463	18 54 55.4	2.680
5	16 26 0.58	2.1493	18 57 33.5	2.590
6	16 28 9.63	2.1523	19 0 6.2	2.500
7	16 30 18.86	2.1552	19 2 33.5	2.409
8	16 32 28.26	2.1582	19 4 55.3	2.317
9	16 34 37.84	2.1612	19 7 11.5	2.224
10	16 36 47.60	2.1641	19 9 22.2	2.132
11	16 38 57.53	2.1670	19 11 27.3	2.039
12	16 41 7.64	2.1699	19 13 26.9	1.946
13	16 43 17.92	2.1728	19 15 20.8	1.851
14	16 45 28.37	2.1757	19 17 9.0	1.757
15	16 47 39.00	2.1786	19 18 51.6	1.662
16	16 49 49.80	2.1813	19 20 28.4	1.566
17	16 52 0.76	2.1841	19 21 59.5	1.471
18	16 54 11.89	2.1869	19 23 24.9	1.375
19	16 56 23.19	2.1897	19 24 44.5	1.278
20	16 58 34.66	2.1925	19 25 58.2	1.180
21	17 0 46.29	2.1952	19 27 6.1	1.083
22	17 2 58.08	2.1979	19 28 8.2	0.986
23	17 5 10.03	2.2006	19 29 4.4	0.887
24	17 7 22.15	2.2032	S. 19 29 54.6	0.788

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 7 22.15	2.2032	S. 19 29 54.6	0.786
1	17 9 34.42	2.2058	19 30 38.9	0.688
2	17 11 46.85	2.2085	19 31 17.2	0.589
3	17 13 59.44	2.2111	19 31 49.6	0.490
4	17 16 12.18	2.2137	19 32 16.0	0.389
5	17 18 25.08	2.2162	19 32 36.3	0.288
6	17 20 38.13	2.2187	19 32 50.6	0.187
7	17 22 51.33	2.2212	19 32 58.8	− 0.086
8	17 25 4.67	2.2236	19 33 0.9	+ 0.016
9	17 27 18.16	2.2260	19 32 56.9	0.118
10	17 29 31.79	2.2283	19 32 46.8	0.220
11	17 31 45.56	2.2307	19 32 30.5	0.322
12	17 33 59.48	2.2331	19 32 8.1	0.425
13	17 36 13.53	2.2353	19 31 39.5	0.528
14	17 38 27.72	2.2376	19 31 4.7	0.632
15	17 40 42.05	2.2399	19 30 23.6	0.737
16	17 42 56.51	2.2421	19 29 36.3	0.840
17	17 45 11.10	2.2443	19 28 42.8	0.944
18	17 47 25.83	2.2465	19 27 43.0	1.049
19	17 49 40.68	2.2485	19 26 36.9	1.154
20	17 51 55.65	2.2506	19 25 24.5	1.259
21	17 54 10.75	2.2526	19 24 5.8	1.364
22	17 56 25.97	2.2546	19 22 40.8	1.470
23	17 58 41.30	2.2565	S. 19 21 9.4	1.576

TUESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 0 56.75	2.2584	S. 19 19 31.7	1.682
1	18 3 12.31	2.2603	19 17 47.6	1.787
2	18 5 27.99	2.2623	19 15 57.2	1.893
3	18 7 43.78	2.2641	19 14 0.4	2.000
4	18 9 59.68	2.2658	19 11 57.2	2.107
5	18 12 15.68	2.2676	19 9 47.6	2.213
6	18 14 31.79	2.2693	19 7 31.6	2.320
7	18 16 48.00	2.2710	19 5 9.2	2.427
8	18 19 4.31	2.2726	19 2 40.4	2.534
9	18 21 20.71	2.2741	19 0 5.1	2.641
10	18 23 37.20	2.2757	18 57 23.4	2.748
11	18 25 53.79	2.2772	18 54 35.3	2.856
12	18 28 10.47	2.2787	18 51 40.7	2.963
13	18 30 27.23	2.2801	18 48 39.7	3.070
14	18 32 44.08	2.2816	18 45 32.3	3.177
15	18 35 1.02	2.2830	18 42 18.4	3.285
16	18 37 18.04	2.2843	18 38 58.1	3.392
17	18 39 35.13	2.2855	18 35 31.4	3.499
18	18 41 52.30	2.2867	18 31 58.2	3.607
19	18 44 9.54	2.2879	18 28 18.6	3.714
20	18 46 26.85	2.2892	18 24 32.5	3.822
21	18 48 44.24	2.2903	18 20 40.0	3.928
22	18 51 1.69	2.2913	18 16 41.1	4.035
23	18 53 19.20	2.2923	18 12 35.8	4.142
24	18 55 36.77	2.2933	S. 18 8 24.0	4.250

WEDNESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 55 36.77	2.2933	S. 18 8 24.0	4.250
1	18 57 54.40	2.2943	18 4 5.8	4.357
2	19 0 12.09	2.2953	17 59 41.2	4.463
3	19 2 29.84	2.2962	17 55 10.3	4.569
4	19 4 47.64	2.2971	17 50 33.0	4.676
5	19 7 5.49	2.2979	17 45 49.3	4.782
6	19 9 23.39	2.2987	17 40 59.2	4.888
7	19 11 41.33	2.2994	17 36 2.8	4.993
8	19 13 59.32	2.3002	17 31 0.1	5.098
9	19 16 17.35	2.3008	17 25 51.0	5.204
10	19 18 35.42	2.3015	17 20 35.6	5.309
11	19 20 53.53	2.3022	17 15 13.9	5.413
12	19 23 11.68	2.3027	17 9 46.0	5.517
13	19 25 29.86	2.3032	17 4 11.8	5.622
14	19 27 48.07	2.3037	16 58 31.4	5.726
15	19 30 6.31	2.3042	16 52 44.7	5.830
16	19 32 24.58	2.3046	16 46 51.8	5.933
17	19 34 42.87	2.3050	16 40 52.8	6.035
18	19 37 1.18	2.3054	16 34 47.6	6.137
19	19 39 19.52	2.3057	16 28 36.3	6.239
20	19 41 37.87	2.3060	16 22 18.9	6.341
21	19 43 56.24	2.3063	16 15 55.4	6.442
22	19 46 14.63	2.3066	16 9 25.8	6.544
23	19 48 33.03	2.3068	S. 16 2 50.1	6.645

THURSDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 50 51.45	2.3071	S. 15 56 8.4	6.744
1	19 53 9.88	2.3072	15 49 20.8	6.843
2	19 55 28.31	2.3073	15 42 27.2	6.942
3	19 57 46.75	2.3074	15 35 27.7	7.041
4	20 0 5.20	2.3075	15 28 22.3	7.138
5	20 2 23.65	2.3075	15 21 11.1	7.235
6	20 4 42.10	2.3076	15 13 54.1	7.332
7	20 7 0.56	2.3076	15 6 31.3	7.428
8	20 9 19.01	2.3075	14 59 2.7	7.524
9	20 11 37.46	2.3075	14 51 28.4	7.619
10	20 13 55.91	2.3074	14 43 48.4	7.714
11	20 16 14.35	2.3073	14 36 2.7	7.808
12	20 18 32.79	2.3072	14 28 11.4	7.901
13	20 20 51.22	2.3071	14 20 14.6	7.993
14	20 23 9.64	2.3069	14 12 12.3	8.085
15	20 25 28.05	2.3067	14 4 4.4	8.177
16	20 27 46.45	2.3066	13 55 51.1	8.267
17	20 30 4.84	2.3064	13 47 32.4	8.357
18	20 32 23.22	2.3062	13 39 8.3	8.446
19	20 34 41.58	2.3059	13 30 38.9	8.534
20	20 36 59.93	2.3057	13 22 4.3	8.621
21	20 39 18.26	2.3053	13 13 24.4	8.707
22	20 41 36.57	2.3050	13 4 39.4	8.793
23	20 43 54.86	2.3047	12 55 49.2	8.879
24	20 46 13.14	2.3045	S. 12 46 53.9	8.963

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 17.					SUNDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 46 13.14	2.3045	S. 12 46 53.9	8.963	0	22 36 25.21	2.2896	S. 4 17 56.2	11.818
1	20 48 31.40	2.3042	12 37 53.6	9.047	1	22 38 42.58	2.2896	4 6 6.2	11.848
2	20 50 49.64	2.3038	12 28 48.3	9.129	2	22 40 59.96	2.2897	3 54 14.4	11.878
3	20 53 7.85	2.3034	12 19 38.1	9.211	3	22 43 17.34	2.2897	3 42 20.8	11.907
4	20 55 26.05	2.3031	12 10 23.0	9.292	4	22 45 34.72	2.2897	3 30 25.6	11.933
5	20 57 44.23	2.3027	12 1 3.1	9.372	5	22 47 52.11	2.2898	3 18 28.9	11.958
6	21 0 2.38	2.3023	11 51 38.3	9.452	6	22 50 9.50	2.2899	3 6 30.7	11.982
7	21 2 20.51	2.3020	11 42 8.8	9.530	7	22 52 26.90	2.2900	2 54 31.1	12.004
8	21 4 38.62	2.3017	11 32 34.7	9.607	8	22 54 44.30	2.2901	2 42 30.2	12.025
9	21 6 56.71	2.3013	11 22 56.0	9.683	9	22 57 1.71	2.2902	2 30 28.1	12.045
10	21 9 14.77	2.3008	11 13 12.7	9.759	10	22 59 19.13	2.2904	2 18 24.8	12.064
11	21 11 32.81	2.3004	11 3 24.9	9.834	11	23 1 36.56	2.2907	2 6 20.4	12.082
12	21 13 50.82	2.3000	10 53 32.6	9.908	12	23 3 54.01	2.2909	1 54 15.0	12.098
13	21 16 8.81	2.2996	10 43 35.9	9.980	13	23 6 11.47	2.2912	1 42 8.7	12.112
14	21 18 26.77	2.2992	10 33 35.0	10.051	14	23 8 28.95	2.2914	1 30 1.6	12.124
15	21 20 44.71	2.2988	10 23 29.8	10.122	15	23 10 46.44	2.2917	1 17 53.8	12.136
16	21 23 2.63	2.2984	10 13 20.4	10.192	16	23 13 3.95	2.2921	1 5 45.3	12.147
17	21 25 20.52	2.2980	10 3 6.8	10.260	17	23 15 21.49	2.2925	0 53 36.2	12.155
18	21 27 38.39	2.2976	9 52 49.2	10.327	18	23 17 39.05	2.2928	0 41 26.7	12.162
19	21 29 56.23	2.2972	9 42 27.6	10.393	19	23 19 56.63	2.2932	0 29 16.8	12.168
20	21 32 14.05	2.2968	9 32 2.0	10.459	20	23 22 14.24	2.2937	0 17 6.5	12.174
21	21 34 31.85	2.2964	9 21 32.5	10.523	21	23 24 31.88	2.2942	S. 0 4 55.9	12.178
22	21 36 49.62	2.2960	9 10 59.2	10.587	22	23 26 49.54	2.2946	N. 0 7 14.9	12.180
23	21 39 7.37	2.2957	S. 9 0 22.1	10.649	23	23 29 7.23	2.2952	N. 0 19 25.7	12.180
	SATURDAY 18.					MONDAY 20.			
0	21 41 25.10	2.2953	S. 8 49 41.3	10.710	0	23 31 24.96	2.2957	N. 0 31 36.5	12.179
1	21 43 42.80	2.2948	8 38 56.9	10.769	1	23 33 42.72	2.2963	0 43 47.2	12.177
2	21 46 0.48	2.2945	8 28 9.0	10.828	2	23 36 0.52	2.2969	0 55 57.8	12.174
3	21 48 18.14	2.2942	8 17 17.5	10.887	3	23 38 18.35	2.2975	1 8 8.1	12.169
4	21 50 35.78	2.2938	8 6 22.6	10.943	4	23 40 36.22	2.2982	1 20 18.1	12.163
5	21 52 53.40	2.2934	7 55 24.4	10.998	5	23 42 54.13	2.2989	1 32 27.7	12.156
6	21 55 10.99	2.2931	7 44 22.9	11.052	6	23 45 12.09	2.2996	1 44 36.8	12.147
7	21 57 28.57	2.2928	7 33 18.2	11.105	7	23 47 30.09	2.3003	1 56 45.4	12.136
8	21 59 46.13	2.2925	7 22 10.3	11.157	8	23 49 48.13	2.3011	2 8 53.2	12.123
9	22 2 3.67	2.2922	7 10 59.3	11.208	9	23 52 6.22	2.3019	2 21 0.2	12.110
10	22 4 21.19	2.2919	6 59 45.3	11.257	10	23 54 24.36	2.3027	2 33 6.4	12.097
11	22 6 38.70	2.2917	6 48 28.5	11.304	11	23 56 42.55	2.3036	2 45 11.8	12.082
12	22 8 56.19	2.2914	6 37 8.8	11.351	12	23 59 0.79	2.3044	2 57 16.2	12.064
13	22 11 13.67	2.2912	6 25 46.3	11.397	13	0 1 19.08	2.3053	3 9 19.5	12.045
14	22 13 31.13	2.2909	6 14 21.1	11.442	14	0 3 37.43	2.3063	3 21 21.6	12.025
15	22 15 48.58	2.2907	6 2 53.2	11.486	15	0 5 55.84	2.3073	3 33 22.5	12.003
16	22 18 6.02	2.2906	5 51 22.8	11.528	16	0 8 14.31	2.3083	3 45 22.0	11.980
17	22 20 23.45	2.2904	5 39 49.9	11.569	17	0 10 32.84	2.3093	3 57 20.1	11.957
18	22 22 40.86	2.2902	5 28 14.5	11.609	18	0 12 51.42	2.3103	4 9 16.8	11.932
19	22 24 58.27	2.2901	5 16 36.8	11.647	19	0 15 10.07	2.3113	4 21 11.9	11.904
20	22 27 15.67	2.2899	5 4 56.9	11.683	20	0 17 28.78	2.3124	4 33 5.3	11.876
21	22 29 33.06	2.2898	4 53 14.8	11.719	21	0 19 47.56	2.3136	4 44 57.1	11.847
22	22 31 50.45	2.2897	4 41 30.6	11.753	22	0 22 6.41	2.3147	4 56 46.9	11.816
23	22 34 7.83	2.2897	4 29 44.4	11.787	23	0 24 25.33	2.3158	5 8 34.9	11.783
24	22 36 25.21	2.2896	S. 4 17 56.2	11.818	24	0 26 44.31	2.3170	N. 5 20 20.8	11.749

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 26 44.31	2.3170	N. 5 20 20.8	11.749
1	0 29 3.37	2.3182	5 32 4.7	11.714
2	0 31 22.50	2.3195	5 43 46.5	11.678
3	0 33 41.71	2.3207	5 55 26.1	11.641
4	0 36 0.99	2.3220	6 7 3.4	11.602
5	0 38 20.35	2.3233	6 18 38.3	11.562
6	0 40 39.79	2.3247	6 30 10.8	11.520
7	0 42 59.31	2.3260	6 41 40.7	11.477
8	0 45 18.91	2.3273	6 53 8.0	11.432
9	0 47 38.59	2.3287	7 4 32.6	11.387
10	0 49 58.36	2.3302	7 15 54.4	11.340
11	0 52 18.21	2.3316	7 27 13.4	11.292
12	0 54 38.15	2.3331	7 38 29.4	11.242
13	0 56 58.18	2.3345	7 49 42.4	11.191
14	0 59 18.29	2.3359	8 0 52.3	11.139
15	1 1 38.49	2.3374	8 11 59.1	11.087
16	1 3 58.78	2.3389	8 23 2.7	11.032
17	1 6 19.16	2.3405	8 34 3.0	10.976
18	1 8 39.64	2.3421	8 44 59.8	10.919
19	1 11 0.21	2.3436	8 55 53.2	10.861
20	1 13 20.87	2.3452	9 6 43.1	10.801
21	1 15 41.63	2.3467	9 17 29.3	10.739
22	1 18 2.48	2.3483	9 28 11.8	10.677
23	1 20 23.43	2.3499	N. 9 38 50.6	10.615

WEDNESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 22 44.47	2.3515	N. 9 49 25.6	10.551
1	1 25 5.61	2.3532	9 59 56.7	10.485
2	1 27 26.85	2.3548	10 10 23.8	10.417
3	1 29 48.19	2.3565	10 20 46.8	10.349
4	1 32 9.63	2.3582	10 31 5.7	10.281
5	1 34 31.17	2.3598	10 41 20.5	10.211
6	1 36 52.81	2.3615	10 51 31.0	10.139
7	1 39 14.55	2.3632	11 1 37.2	10.067
8	1 41 36.39	2.3648	11 11 39.0	9.993
9	1 43 58.33	2.3665	11 21 36.3	9.918
10	1 46 20.37	2.3682	11 31 29.1	9.842
11	1 48 42.51	2.3698	11 41 17.3	9.764
12	1 51 4.75	2.3715	11 51 0.8	9.686
13	1 53 27.09	2.3732	12 0 39.6	9.607
14	1 55 49.54	2.3750	12 10 13.6	9.527
15	1 58 12.09	2.3767	12 19 42.8	9.446
16	2 0 34.74	2.3783	12 29 7.1	9.363
17	2 2 57.49	2.3800	12 38 26.4	9.279
18	2 5 20.34	2.3817	12 47 40.6	9.194
19	2 7 43.29	2.3833	12 56 49.7	9.109
20	2 10 6.34	2.3850	13 5 53.7	9.022
21	2 12 29.49	2.3867	13 14 52.4	8.934
22	2 14 52.74	2.3883	13 23 45.8	8.846
23	2 17 16.09	2.3899	13 32 33.9	8.757
24	2 19 39.53	2.3915	N.13 41 16.7	8.667

THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 19 39.53	2.3915	N.13 41 16.7	8.667
1	2 22 3.07	2.3932	13 49 54.0	8.575
2	2 24 26.71	2.3948	13 58 25.7	8.482
3	2 26 50.44	2.3963	14 6 51.8	8.389
4	2 29 14.27	2.3979	14 15 12.3	8.295
5	2 31 38.19	2.3995	14 23 27.2	8.200
6	2 34 2.21	2.4011	14 31 36.3	8.104
7	2 36 26.32	2.4026	14 39 39.6	8.007
8	2 38 50.52	2.4040	14 47 37.1	7.909
9	2 41 14.80	2.4054	14 55 28.7	7.810
10	2 43 39.17	2.4069	15 3 14.3	7.710
11	2 46 3.63	2.4084	15 10 53.9	7.610
12	2 48 28.18	2.4098	15 18 27.5	7.509
13	2 50 52.81	2.4112	15 25 55.0	7.407
14	2 53 17.52	2.4126	15 33 16.3	7.304
15	2 55 42.32	2.4139	15 40 31.5	7.201
16	2 58 7.19	2.4152	15 47 40.5	7.097
17	3 0 32.14	2.4165	15 54 43.2	6.992
18	3 2 57.17	2.4177	16 1 39.5	6.886
19	3 5 22.27	2.4189	16 8 29.5	6.780
20	3 7 47.44	2.4202	16 15 13.1	6.673
21	3 10 12.69	2.4213	16 21 50.3	6.566
22	3 12 38.00	2.4224	16 28 21.0	6.457
23	3 15 3.38	2.4236	N.16 34 45.1	6.348

FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 17 28.83	2.4247	N.16 41 2.7	6.238
1	3 19 54.34	2.4257	16 47 13.7	6.128
2	3 22 19.91	2.4266	16 53 18.0	6.017
3	3 24 45.53	2.4275	16 59 15.7	5.906
4	3 27 11.21	2.4284	17 5 6.7	5.794
5	3 29 36.94	2.4293	17 10 50.9	5.681
6	3 32 2.73	2.4302	17 16 28.4	5.567
7	3 34 28.57	2.4310	17 21 59.0	5.453
8	3 36 54.45	2.4317	17 27 22.8	5.340
9	3 39 20.37	2.4323	17 32 39.8	5.226
10	3 41 46.33	2.4330	17 37 49.9	5.110
11	3 44 12.33	2.4337	17 42 53.0	4.994
12	3 46 38.37	2.4343	17 47 49.2	4.878
13	3 49 4.44	2.4348	17 52 38.4	4.762
14	3 51 30.54	2.4353	17 57 20.6	4.645
15	3 53 56.67	2.4357	18 1 55.8	4.527
16	3 56 22.82	2.4360	18 6 23.9	4.410
17	3 58 48.99	2.4363	18 10 45.0	4.292
18	4 1 15.18	2.4366	18 14 59.0	4.174
19	4 3 41.38	2.4368	18 19 5.9	4.055
20	4 6 7.59	2.4370	18 23 5.6	3.936
21	4 8 33.82	2.4372	18 26 58.2	3.817
22	4 11 0.05	2.4373	18 30 43.6	3.697
23	4 13 26.28	2.4372	18 34 21.8	3.577
24	4 15 52.51	2.4371	N.18 37 52.9	3.458

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	SATURDAY 25.					MONDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 15 52.51	2.4371	N.18 37 52.9	3.458	0	6 11 43.50	2.3683	N.19 5 11.6	2.251
1	4 18 18.73	2.4370	18 41 16.8	3.338	1	6 14 5.52	2.3655	19 2 53.2	2.362
2	4 20 44.95	2.4369	18 44 33.4	3.217	2	6 16 27.36	2.3626	19 0 28.2	2.473
3	4 23 11.16	2.4367	13 47 42.8	3.097	3	6 18 49.03	2.3597	18 57 56.5	2.583
4	4 25 37.35	2.4364	18 50 45.0	2.976	4	6 21 10.53	2.3569	18 55 18.2	2.692
5	4 28 3.53	2.4362	18 53 39.9	2.854	5	6 23 31.86	2.3540	18 52 33.4	2.802
6	4 30 29.69	2.4358	18 56 27.5	2.733	6	6 25 53.01	2.3510	18 49 42.0	2.911
7	4 32 55.82	2.4353	18 59 7.9	2.612	7	6 28 13.98	2.3480	18 46 44.1	3.018
8	4 35 21.92	2.4348	19 1 41.0	2.491	8	6 30 34.77	2.3450	18 43 39.8	3.126
9	4 37 48.00	2.4343	19 4 6.8	2.369	9	6 32 55.38	2.3419	18 40 29.0	3.233
10	4 40 14.04	2.4337	19 6 25.3	2.248	10	6 35 15.80	2.3387	18 37 11.8	3.339
11	4 42 40.04	2.4329	19 8 36.6	2.127	11	6 37 36.03	2.3355	18 33 48.3	3.444
12	4 45 5.99	2.4322	19 10 40.6	2.006	12	6 39 56.06	2.3323	18 30 18.5	3.549
13	4 47 31.90	2.4314	19 12 37.3	1.884	13	6 42 15.90	2.3291	18 26 42.4	3.653
14	4 49 57.76	2.4307	19 14 26.7	1.762	14	6 44 35.55	2.3258	18 23 0.1	3.757
15	4 52 23.58	2.4298	19 16 8.8	1.641	15	6 46 55.00	2.3225	18 19 11.6	3.860
16	4 54 49.34	2.4288	19 17 43.6	1.519	16	6 49 14.25	2.3192	18 15 16.9	3.962
17	4 57 15.04	2.4278	19 19 11.1	1.398	17	6 51 33.30	2.3158	18 11 16.2	4.063
18	4 59 40.67	2.4267	19 20 31.4	1.277	18	6 53 52.15	2.3124	18 7 9.4	4.163
19	5 2 6.24	2.4256	19 21 44.4	1.156	19	6 56 10.79	2.3089	18 2 56.6	4.263
20	5 4 31.74	2.4243	19 22 50.1	1.034	20	6 58 29.22	2.3055	17 58 37.8	4.362
21	5 6 57.16	2.4231	19 23 48.5	0.913	21	7 0 47.45	2.3020	17 54 13.1	4.461
22	5 9 22.51	2.4218	19 24 39.7	0.793	22	7 3 5.46	2.2984	17 49 42.5	4.559
23	5 11 47.78	2.4204	N.19 25 23.7	0.672	23	7 5 23.26	2.2949	N.17 45 6.0	4.657
	SUNDAY 26.					TUESDAY 28.			
0	5 14 12.96	2.4190	N.19 26 0.4	0.552	0	7 7 40.85	2.2913	N.17 40 23.7	4.753
1	5 16 38.06	2.4176	19 26 29.9	0.432	1	7 9 58.22	2.2878	17 35 35.7	4.848
2	5 19 3.07	2.4160	19 26 52.2	0.311	2	7 12 15.38	2.2842	17 30 42.0	4.943
3	5 21 27.98	2.4144	19 27 7.2	0.191	3	7 14 32.32	2.2805	17 25 42.6	5.037
4	5 23 52.80	2.4127	19 27 15.1	+ 0.072	4	7 16 49.04	2.2768	17 20 37.6	5.130
5	5 26 17.51	2.4110	19 27 15.8	− 0.048	5	7 19 5.54	2.2732	17 15 27.0	5.222
6	5 28 42.12	2.4092	19 27 9.3	0.167	6	7 21 21.82	2.2695	17 10 10.9	5.314
7	5 31 6.62	2.4074	19 26 55.7	0.286	7	7 23 37.88	2.2657	17 4 49.3	5.405
8	5 33 31.01	2.4056	19 26 35.0	0.405	8	7 25 53.71	2.2620	16 59 22.3	5.494
9	5 35 55.29	2.4037	19 26 7.1	0.523	9	7 28 9.32	2.2582	16 53 50.0	5.583
10	5 38 19.45	2.4017	19 25 32.2	0.641	10	7 30 24.70	2.2545	16 48 12.4	5.672
11	5 40 43.49	2.3996	19 24 50.2	0.759	11	7 32 39.86	2.2507	16 42 29.4	5.760
12	5 43 7.40	2.3975	19 24 1.1	0.877	12	7 34 54.79	2.2469	16 36 41.2	5.846
13	5 45 31.19	2.3954	19 23 5.0	0.993	13	7 37 9.49	2.2431	16 30 47.9	5.932
14	5 47 54.85	2.3932	19 22 1.9	1.109	14	7 39 23.96	2.2393	16 24 49.4	6.017
15	5 50 18.37	2.3909	19 20 51.9	1.225	15	7 41 38.21	2.2356	16 18 45.8	6.102
16	5 52 41.75	2.3885	19 19 34.9	1.341	16	7 43 52.23	2.2317	16 12 37.2	6.185
17	5 55 4.99	2.3862	19 18 11.0	1.457	17	7 46 6.01	2.2278	16 6 23.6	6.267
18	5 57 28.09	2.3838	19 16 40.1	1.572	18	7 48 19.56	2.2240	16 0 5.1	6 349
19	5 59 51.05	2.3813	19 15 2.4	1.686	19	7 50 32.89	2.2202	15 53 41.7	6.430
20	6 2 13.85	2.3788	19 13 17.8	1.800	20	7 52 45.98	2.2163	15 47 13.5	6.510
21	6 4 36.50	2.3762	19 11 26.4	1.913	21	7 54 58.84	2.2124	15 40 40.5	6.589
22	6 6 58.99	2.3735	19 9 28.2	2.026	22	7 57 11.47	2.2086	15 34 2.8	6.667
23	6 9 21.32	2.3709	19 7 23.3	2.138	23	7 59 23.87	2.2047	15 27 20.5	6.743
24	6 11 43.50	2.3683	N.19 5 11.6	2.251	24	8 1 36.03	2.2008	N.15 20 33.6	6.820

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 1 36.03	2.2008	N.15 20 33.6	6.820
1	8 3 47.96	2.1969	15 13 42.1	6.896
2	8 5 59.66	2.1931	15 6 46.1	6.971
3	8 8 11.13	2.1892	14 59 45.6	7.045
4	8 10 22.37	2.1853	14 52 40.7	7.117
5	8 12 33.37	2.1814	14 45 31.5	7.189
6	8 14 44.14	2.1776	14 38 18.0	7.260
7	8 16 54.68	2.1737	14 31 0.3	7.331
8	8 19 4.99	2.1699	14 23 38.3	7.401
9	8 21 15.07	2.1661	14 16 12.2	7.469
10	8 23 24.92	2.1622	14 8 42.0	7.537
11	8 25 34.54	2.1583	14 1 7.8	7.603
12	8 27 43.92	2.1545	13 53 29.6	7.669
13	8 29 53.08	2.1507	13 45 47.5	7.734
14	8 32 2.01	2.1469	13 38 1.5	7.798
15	8 34 10.71	2.1432	13 30 11.7	7.861
16	8 36 19.19	2.1394	13 22 18.2	7.923
17	8 38 27.44	2.1357	13 14 21.0	7.984
18	8 40 35.47	2.1319	13 6 20.1	8.045
19	8 42 43.27	2.1282	12 58 15.6	8.105
20	8 44 50.85	2.1245	12 50 7.5	8.163
21	8 46 58.21	2.1207	12 41 56.0	8.221
22	8 49 5.34	2.1170	12 33 41.0	8.278
23	8 51 12.25	2.1134	N.12 25 22.6	8.334

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 53 18.95	2.1098	N.12 17 0.9	8.389
1	8 55 25.43	2.1062	12 8 35.9	8.443
2	8 57 31.69	2.1025	12 0 7.7	8.497
3	8 59 37.73	2.0989	11 51 36.3	8.549
4	9 1 43.56	2.0954	11 43 1.8	8.600
5	9 3 49.18	2.0918	11 34 24.3	8.650
6	9 5 54.58	2.0882	11 25 43.8	8.700
7	9 7 59.77	2.0847	11 17 0.3	8.749
8	9 10 4.75	2.0813	11 8 13.9	8.797
9	9 12 9.53	2.0779	10 59 24.6	8.845
10	9 14 14.10	2.0745	10 50 32.5	8.892
11	9 16 18.47	2.0711	10 41 37.6	8.938
12	9 18 22.63	2.0677	10 32 40.0	8.982
13	9 20 26.59	2.0643	10 23 39.8	9.024
14	9 22 30.35	2.0609	10 14 37.1	9.067
15	9 24 33.90	2.0576	10 5 31.8	9.109
16	9 26 37.26	2.0543	9 56 24.0	9.150
17	9 28 40.42	2.0511	9 47 13.8	9.190
18	9 30 43.39	2.0479	9 38 1.2	9.229
19	9 32 46.17	2.0447	9 28 46.3	9.267
20	9 34 48.76	2.0415	9 19 29.1	9.305
21	9 36 51.15	2.0383	9 10 9.7	9.342
22	9 38 53.36	2.0352	9 0 48.1	9.378
23	9 40 55.38	2.0322	8 51 24.4	9.413
24	9 42 57.22	2.0292	N. 8 41 58.5	9.448

FRIDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 42 57.22	2.0292	N. 8 41 58.5	9.448
1	9 44 58.88	2.0262	8 32 30.6	9.481
2	9 47 0.36	2.0232	8 23 0.8	9.513
3	9 49 1.66	2.0202	8 13 29.1	9.544
4	9 51 2.78	2.0172	8 3 55.5	9.575
5	9 53 3.72	2.0142	7 54 20.1	9.605
6	9 55 4.49	2.0114	7 44 42.9	9.634
7	9 57 5.09	2.0087	7 35 4.0	9.662
8	9 59 5.53	2.0059	7 25 23.4	9.690
9	10 1 5.80	2.0031	7 15 41.2	9.717
10	10 3 5.90	2.0003	7 5 57.4	9.742
11	10 5 5.84	1.9976	6 56 12.1	9.767
12	10 7 5.62	1.9950	6 46 25.3	9.792
13	10 9 5.24	1.9924	6 36 37.1	9.815
14	10 11 4.71	1.9898	6 26 47.5	9.837
15	10 13 4.02	1.9872	6 16 56.6	9.859
16	10 15 3.18	1.9847	6 7 4.4	9.880
17	10 17 2.19	1.9822	5 57 11.0	9.901
18	10 19 1.05	1.9798	5 47 16.3	9.921
19	10 20 59.77	1.9774	5 37 20.5	9.939
20	10 22 58.34	1.9750	5 27 23.7	9.956
21	10 24 56.77	1.9727	5 17 25.8	9.973
22	10 26 55.06	1.9703	5 7 26.9	9.989
23	10 28 53.21	1.9681	N. 4 57 27.1	10 005

SATURDAY, SEPTEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 30 51.23	1.9659	N. 4 47 26.3	10.020

PHASES OF THE MOON.

	d	h	m
● New Moon	2	13	26.2
☽ First Quarter . . .	10	13	29.3
○ Full Moon	18	0	53.8
☾ Last Quarter. . . .	24	17	31.9

	d	h
☾ Apogee.	8	22.1
☾ Perigee.	20	19.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
4	Sun	W.	17° 46′ 40″	3300	19° 10′ 52″	3288	20° 35′ 18″	3281	21° 59′ 52″	3277
	Spica	E.	53 16 34	2785	51 41 46	2796	50 7 13	2807	48 32 54	2818
	Antares	E.	98 48 31	2819	97 14 28	2830	95 40 39	2841	94 7 4	2852
5	Sun	W.	29 2 48	3290	30 27 11	3296	31 51 27	3303	33 15 35	3309
	Spica	E.	40 44 52	2873	39 11 58	2883	37 39 17	2893	36 6 49	2903
	Antares	E.	86 22 39	2905	84 50 27	2916	83 18 29	2927	81 46 44	2938
6	Sun	W.	40 14 15	3346	41 37 33	3354	43 0 42	3361	44 23 43	3369
	Spica	E.	28 27 40	2952	26 56 27	2961	25 25 25	2969	23 54 34	2978
	Antares	E.	74 11 14	2987	72 40 45	2997	71 10 28	3006	69 40 23	3015
7	Sun	W.	51 16 44	3403	52 38 57	3408	54 1 4	3415	55 23 4	3420
	Antares	E.	62 12 41	3058	60 43 40	3065	59 14 48	3073	57 46 6	3080
	α Aquilæ	E.	112 20 50	3486	111 0 10	3483	109 39 27	3480	108 18 41	3478
8	Sun	W.	62 11 39	3442	63 33 8	3446	64 54 33	3448	66 15 55	3451
	Antares	E.	50 24 44	3114	48 56 52	3121	47 29 8	3127	46 1 31	3133
	α Aquilæ	E.	101 34 23	3472	100 13 28	3472	98 52 33	3472	97 31 38	3471
9	Sun	W.	73 2 14	3456	74 23 27	3455	75 44 41	3454	77 5 56	3454
	Antares	E.	38 45 13	3163	37 18 20	3169	35 51 34	3176	34 24 56	3183
	α Aquilæ	E.	90 46 57	3471	89 26 1	3471	88 5 5	3471	86 44 9	3471
10	Sun	W.	83 52 43	3439	85 14 15	3435	86 35 52	3430	87 57 34	3424
	Spica	W.	19 17 56	3060	20 46 55	3055	22 16 0	3051	23 45 10	3045
	α Aquilæ	E.	79 59 31	3473	78 38 37	3473	77 17 43	3474	75 56 50	3474
11	Sun	W.	94 47 49	3392	96 10 15	3383	97 32 51	3373	98 55 38	3364
	Spica	W.	31 12 49	3013	32 42 46	3005	34 12 53	2997	35 43 10	2988
	α Aquilæ	E.	69 12 40	3482	67 51 56	3484	66 31 14	3487	65 10 35	3491
	Fomalhaut	E.	98 56 43	3471	97 35 47	3461	96 14 39	3450	94 53 19	3438
12	Sun	W.	105 52 22	3312	107 16 20	3300	108 40 32	3288	110 4 58	3276
	Spica	W.	43 17 30	2938	44 49 1	2927	46 20 45	2915	47 52 44	2904
	α Aquilæ	E.	58 28 41	3522	57 8 41	3531	55 48 51	3542	54 29 13	3554
	Fomalhaut	E.	88 3 40	3388	86 41 10	3378	85 18 29	3369	83 55 37	3359
	α Pegasi	E.	104 44 42	3117	103 16 53	3104	101 48 48	3090	100 20 26	3077
13	Sun	W.	117 10 57	3207	118 36 58	3193	120 3 16	3177	121 29 52	3163
	Spica	W.	55 36 36	2839	57 10 13	2824	58 44 9	2811	60 18 23	2797
	α Aquilæ	E.	47 55 19	3654	46 37 43	3683	45 20 38	3718	44 4 10	3757
	Fomalhaut	E.	76 58 43	3318	75 34 52	3311	74 10 53	3304	72 46 46	3299
	α Pegasi	E.	92 54 26	3007	91 24 22	2993	89 54 1	2979	88 23 22	2965
14	Spica	W.	68 14 20	2721	69 50 32	2705	71 27 5	2689	73 3 59	2674
	Antares	W.	23 42 25	2934	25 14 1	2894	26 46 28	2858	28 19 41	2825
	Fomalhaut	E.	65 44 47	3281	64 20 13	3281	62 55 39	3281	61 31 6	3283
	α Pegasi	E.	80 45 42	2895	79 13 17	2881	77 40 34	2868	76 7 34	2855
	α Arietis	E.	124 13 25	2816	122 39 18	2797	121 4 46	2778	119 29 50	2759
15	Spica	W.	81 13 51	2593	82 52 55	2577	84 32 22	2561	86 12 11	2545
	Antares	W.	36 15 29	2691	37 52 21	2667	39 29 45	2645	41 7 39	2623

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
4	Sun	W.	23° 24′ 30″	3976	24° 49′ 9″	3978	26° 13′ 46″	3981	27° 38′ 19″	3985
	Spica	E.	46 58 49	2628	45 24 58	2640	43 51 22	2651	42 18 0	2662
	Antares	E.	92 33 43	2662	91 0 36	2673	89 27 43	2684	87 55 4	2695
5	Sun	W.	34 39 36	3316	36 3 29	3324	37 27 13	3331	38 50 48	3338
	Spica	E.	34 34 34	2913	33 2 32	2923	31 30 42	2933	29 59 5	2942
	Antares	E.	80 15 13	2947	78 43 54	2957	77 12 48	2968	75 41 55	2977
6	Sun	W.	45 46 35	3376	47 9 19	3383	48 31 55	3390	49 54 23	3396
	Spica .	E.	22 23 54	2987	20 53 25	2995	19 23 6	3003	17 52 57	3011
	Antares	E.	68 10 29	3024	66 40 46	3033	65 11 14	3041	63 41 52	3050
7	Sun	W.	56 44 58	3425	58 6 46	3430	59 28 29	3435	60 50 6	3438
	Antares	E.	56 17 32	3087	54 49 7	3095	53 20 51	3101	51 52 43	3109
	α Aquilæ	E.	106 57 52	3477	105 37 2	3475	104 16 10	3474	102 55 17	3473
8	Sun	W.	67 37 14	3453	68 58 31	3454	70 19 46	3455	71 41 0	3455
	Antares	E.	44 34 1	3138	43 6 38	3144	41 39 22	3151	40 12 14	3157
	α Aquilæ	E.	96 10 42	3471	94 49 46	3471	93 28 50	3471	92 7 53	3471
9	Sun	W.	78 27 12	3452	79 48 30	3449	81 9 51	3446	82 31 15	3443
	Antares	E.	32 58 27	3192	31 32 8	3201	30 6 0	3211	28 40 4	3222
	α Aquilæ	E.	85 23 13	3471	84 2 17	3471	82 41 21	3472	81 20 26	3472
10	Sun	W.	89 19 23	3419	90 41 18	3412	92 3 21	3406	93 25 31	3399
	Spica	W.	25 14 27	3039	26 43 51	3034	28 13 22	3027	29 43 1	3020
	α Aquilæ	E.	74 35 57	3475	73 15 5	3477	71 54 15	3479	70 33 27	3479
11	Sun	W.	100 18 36	3354	101 41 45	3344	103 5 5	3334	104 28 37	3323
	Spica	W.	37 13 38	2979	38 44 17	2969	40 15 9	2959	41 46 13	2949
	α Aquilæ	E.	63 50 1	3496	62 29 32	3500	61 9 8	3506	59 48 51	3513
	Fomalhaut	E.	93 31 46	3429	92 10 2	3418	90 48 6	3408	89 25 59	3398
12	Sun	W.	111 29 38	3263	112 54 33	3249	114 19 44	3235	115 45 12	3220
	Spica	W.	49 24 58	2891	50 57 28	2879	52 30 14	2866	54 3 16	2852
	α Aquilæ	E.	53 9 49	3569	51 50 41	3586	50 31 51	3606	49 13 23	3628
	Fomalhaut	E.	82 32 34	3351	81 9 21	3342	79 45 58	3333	78 22 25	3325
	α Pegasi	E.	98 51 48	3063	97 22 53	3049	95 53 41	3035	94 24 12	3022
13	Sun	W.	122 56 45	3148	124 23 57	3133	125 51 27	3117	127 19 16	3101
	Spica	W.	61 52 55	2782	63 27 46	2767	65 2 57	2752	66 38 28	2736
	α Aquilæ	E.	42 48 23	3802	41 33 23	3854	40 19 16	3913	39 6 9	3980
	Fomalhaut	E.	71 22 33	3293	69 58 13	3288	68 33 48	3285	67 9 19	3282
	α Pegasi	E.	86 52 25	2961	85 21 11	2937	83 49 39	2923	82 17 49	2909
14	Spica	W.	74 41 14	2657	76 18 51	2642	77 56 49	2626	79 35 9	2610
	Antares	W.	29 53 36	2795	31 28 10	2766	33 3 22	2740	34 39 9	2715
	Fomalhaut	E.	60 6 35	3288	58 42 9	3294	57 17 51	3303	55 53 43	3313
	α Pegasi	E.	74 34 17	2841	73 0 43	2828	71 26 52	2816	69 52 45	2804
	α Arietis	E.	117 54 29	2741	116 18 44	2722	114 42 34	2704	113 6 0	2686
15	Spica	W.	87 52 22	2529	89 32 55	2513	91 13 50	2497	92 55 7	2481
	Antares	W.	42 46 2	2603	44 24 53	2582	46 4 12	2563	47 43 58	2543

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
15	Fomalhaut	E.	54° 29′ 47″	3397	53° 6′ 7″	3343	51° 42′ 45″	3363	50° 19′ 46″	3387
	α Pegasi	E.	68 18 23	2792	66 43 45	2782	65 8 53	2771	63 33 47	2760
	α Arietis	E.	111 29 2	2669	109 51 40	2651	108 13 54	2633	106 35 44	2616
16	Spica	W.	94 36 47	2465	96 18 49	2450	98 1 12	2435	99 43 57	2420
	Antares	W.	49 24 11	2525	51 4 49	2507	52 45 53	2489	54 27 22	2472
	Fomalhaut	E.	43 33 26	3585	42 14 35	3646	40 56 50	3716	39 40 20	3799
	α Pegasi	E.	55 35 21	2725	53 59 14	2720	52 23 1	2718	50 46 45	2718
	α Arietis	E.	98 19 6	2533	96 38 38	2517	94 57 48	2502	93 16 37	2487
17	Antares	W.	63 0 37	2393	64 44 22	2378	66 28 28	2364	68 12 54	2350
	α Pegasi	E.	42 46 11	2749	41 10 36	2765	39 35 22	2785	38 0 34	2811
	α Arietis	E.	84 45 32	2417	83 2 21	2403	81 18 51	2391	79 35 3	2380
	Aldebaran	E.	117 57 27	2355	116 12 48	2341	114 27 49	2328	112 42 31	2316
	Saturn	E.	118 32 38	2368	116 48 18	2355	115 3 39	2342	113 18 41	2330
18	Antares	W.	76 59 44	2291	78 45 57	2281	80 32 25	2270	82 19 8	2261
	α Aquilæ	W.	33 46 50	3895	35 0 15	3742	36 16 18	3607	37 34 45	3488
	α Arietis	E.	70 52 10	2330	69 6 54	2322	67 21 26	2314	65 35 47	2308
	Aldebaran	E.	103 51 36	2258	102 4 35	2249	100 17 20	2239	98 29 51	2231
	Saturn	E.	104 29 28	2272	102 42 48	2263	100 55 54	2253	99 8 45	2244
	Mars	E.	121 34 46	2469	119 52 49	2458	118 10 37	2448	116 28 10	2438
19	Antares	W.	91 15 52	2223	93 3 45	2218	94 51 46	2212	96 39 55	2207
	α Aquilæ	W.	44 35 40	3070	46 4 26	3012	47 34 24	2959	49 5 28	2912
	α Arietis	E.	56 45 29	2286	54 59 9	2285	53 12 47	2285	51 26 25	2285
	Aldebaran	E.	89 29 18	2192	87 40 39	2186	85 51 51	2181	84 2 55	2176
	Saturn	E.	90 9 54	2206	88 21 35	2200	86 33 7	2194	84 44 31	2189
	Mars	E.	107 52 42	2397	106 9 3	2391	104 25 15	2384	102 41 18	2380
20	Antares	W.	105 42 9	2194	107 30 46	2192	109 19 25	2192	111 8 4	2192
	α Aquilæ	W.	56 53 56	2741	58 29 42	2716	60 6 1	2694	61 42 49	2675
	α Arietis	E.	42 35 27	2309	40 49 41	2319	39 4 10	2332	37 18 57	2347
	Aldebaran	E.	74 56 40	2160	73 7 12	2158	71 17 41	2157	69 28 8	2156
	Saturn	E.	75 39 53	2172	73 50 44	2170	72 1 32	2169	70 12 18	2168
	Mars	E.	93 59 58	2362	92 15 28	2359	90 30 55	2358	88 46 20	2358
	Jupiter	E.	119 30 13	2238	117 42 42	2236	115 55 8	2234	114 7 31	2233
21	α Aquilæ	W.	69 52 19	2610	71 31 0	2602	73 9 52	2596	74 48 52	2592
	Fomalhaut	W.	42 17 15	3269	43 42 3	3198	45 8 15	3136	46 35 41	3081
	α Pegasi	W.	23 28 16	3455	24 49 30	3288	26 13 56	3152	27 41 3	3040
	Aldebaran	E.	60 20 25	2161	58 30 58	2163	56 41 34	2166	54 52 15	2168
	Saturn	E.	61 6 3	2171	59 16 52	2174	57 27 45	2176	55 38 41	2179
	Mars	E.	80 3 27	2362	78 18 57	2364	76 34 31	2367	74 50 9	2370
	Pollux	E.	102 59 20	2248	101 12 4	2249	99 24 50	2251	97 37 38	2253
	Jupiter	E.	105 9 11	2234	103 21 34	2235	101 33 59	2237	99 46 27	2241
22	α Aquilæ	W.	83 4 50	2587	84 44 2	2591	86 23 9	2595	88 2 11	2600
	Fomalhaut	W.	54 7 13	2892	55 39 42	2868	57 12 42	2846	58 46 10	2826
	α Pegasi	W.	35 24 23	2710	37 0 49	2673	38 38 5	2641	40 16 4	2615
	Aldebaran	E.	45 47 3	2192	43 58 23	2197	42 9 51	2204	40 21 29	2210
	Saturn	E.	46 34 43	2200	44 46 15	2205	42 57 55	2210	41 9 43	2216
	Mars	E.	66 9 41	2393	64 25 57	2399	62 42 21	2405	60 58 54	2412

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
15	Fomalhaut	E.	48° 57′ 15″	3415	47° 35′ 16″	3448	46° 13′ 54″	3487	44° 53′ 15″	3532
	α Pegasi	E.	61 58 27	2751	60 22 55	2744	58 47 13	2736	57 11 21	2730
	α Arietis	E.	104 57 11	2599	103 18 14	2582	101 38 54	2565	99 59 11	2549
16	Spica	W.	101 27 3	2405	103 10 30	2391	104 54 18	2377	106 38 26	2363
	Antares	W.	56 9 15	2455	57 51 32	2439	59 34 11	2423	61 17 13	2407
	Fomalhaut	E.	38 25 17	3895	37 11 52	4007	36 0 19	4137	34 50 53	4288
	α Pegasi	E.	49 10 29	2719	47 34 14	2722	45 58 5	2728	44 22 2	2737
	α Arietis	E.	91 35 5	2472	89 53 12	2457	88 10 58	2442	86 28 24	2430
17	Antares	W.	69 57 40	2338	71 42 44	2325	73 28 7	2313	75 13 47	2302
	α Pegasi	E.	36 26 20	2842	34 52 47	2881	33 20 4	2922	31 48 22	2967
	α Arietis	E.	77 50 59	2368	76 6 39	2357	74 22 3	2348	72 37 13	2339
	Aldebaran	E.	110 56 55	2304	109 11 1	2291	107 24 49	2281	105 38 21	2269
	Saturn	E.	111 33 25	2317	109 47 51	2306	108 2 0	2294	106 15 52	2283
18	Antares	W.	84 6 5	2252	85 53 15	2245	87 40 36	2237	89 28 9	2230
	α Aquilæ	W.	38 55 22	3385	40 17 56	3292	41 42 17	3209	43 8 15	3137
	α Arietis	E.	63 49 59	2302	62 4 2	2296	60 17 57	2292	58 31 46	2288
	Aldebaran	E.	96 42 9	2222	94 54 14	2213	93 6 6	2206	91 17 47	2199
	Saturn	E.	97 21 23	2235	95 33 48	2227	93 46 1	2220	91 58 3	2212
	Mars	E.	114 45 29	2429	113 2 35	2420	111 19 29	2412	109 36 11	2404
19	Antares	W.	98 28 12	2204	100 16 34	2200	102 5 2	2197	103 53 34	2195
	α Aquilæ	W.	50 37 31	2869	52 10 29	2832	53 44 15	2798	55 18 46	2768
	α Arietis	E.	49 40 4	2287	47 53 46	2290	46 7 32	2295	44 21 25	2301
	Aldebaran	E.	82 13 52	2172	80 24 42	2168	78 35 26	2164	76 46 5	2162
	Saturn	E.	82 55 47	2184	81 6 56	2181	79 18 0	2178	77 28 59	2174
	Mars	E.	100 57 14	2375	99 13 3	2371	97 28 46	2367	95 44 24	2364
20	Antares	W.	112 56 43	2193	114 45 21	2194	116 33 57	2197	118 22 29	2200
	α Aquilæ	W.	63 20 3	2657	64 57 40	2643	66 35 36	2630	68 13 50	2619
	α Arietis	E.	35 34 6	2365	33 49 41	2387	32 5 47	2413	30 22 31	2444
	Aldebaran	E.	67 38 34	2156	65 49 0	2157	63 59 27	2157	62 9 55	2158
	Saturn	E.	68 23 2	2168	66 33 46	2168	64 44 31	2168	62 55 16	2170
	Mars	E.	87 1 45	2357	85 17 9	2358	83 32 34	2359	81 48 0	2359
	Jupiter	E.	112 19 52	2232	110 32 12	2231	108 44 31	2231	106 56 50	2233
21	α Aquilæ	W.	76 27 58	2588	78 7 9	2587	79 46 22	2586	81 25 36	2586
	Fomalhaut	W.	48 4 14	3033	49 33 46	2991	51 4 10	2954	52 35 21	2921
	α Pegasi	W.	29 10 26	2948	30 41 44	2872	32 14 39	2808	33 48 56	2755
	Aldebaran	E.	53 3 0	2172	51 13 50	2176	49 24 47	2181	47 35 51	2186
	Saturn	E.	53 49 42	2182	52 0 48	2186	50 12 0	2190	48 23 18	2195
	Mars	E.	73 5 51	2374	71 21 39	2378	69 37 33	2382	67 53 33	2388
	Pollux	E.	95 50 29	2255	94 3 24	2259	92 16 24	2263	90 29 30	2268
	Jupiter	E.	97 59 0	2244	96 11 38	2247	94 24 21	2251	92 37 10	2256
22	α Aquilæ	W.	89 41 6	2606	91 19 53	2612	92 58 31	2621	94 36 58	2629
	Fomalhaut	W.	60 20 2	2810	61 54 15	2798	63 28 46	2786	65 3 32	2776
	α Pegasi	W.	41 54 38	2593	43 33 43	2574	45 13 13	2559	46 53 4	2546
	Aldebaran	E.	38 33 17	2217	36 45 15	2225	34 57 25	2233	33 9 47	2241
	Saturn	E.	39 21 40	2223	37 33 47	2229	35 46 3	2237	33 58 30	2243
	Mars	E.	59 15 37	2419	57 32 30	2427	55 49 34	2435	54 6 49	2442

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Pollux	E.	88° 42′ 43″	2272	86° 56′ 3″	2278	85° 9′ 32″	2284	83° 23′ 9″	2291
	JUPITER	E.	90 50 6	2261	89 3 9	2266	87 16 20	2272	85 29 40	2278
	SUN	E.	126 13 12	2503	124 32 3	2508	122 51 1	2513	121 10 6	2519
23	Fomalhaut	W.	66 38 31	2769	68 13 40	2763	69 48 56	2759	71 24 18	2756
	α Pegasi	W.	48 33 13	2536	50 13 36	2528	51 54 10	2522	53 34 53	2517
	Aldebaran	E.	31 22 21	2250	29 35 8	2260	27 48 9	2270	26 1 25	2281
	SATURN	E.	32 11 7	2251	30 23 55	2259	28 36 55	2266	26 50 6	2274
	MARS	E.	52 24 15	2451	50 41 53	2460	48 59 44	2469	47 17 47	2479
	Pollux	E.	74 33 52	2330	72 48 37	2339	71 3 35	2350	69 18 48	2360
	JUPITER	E.	76 38 38	2313	74 52 57	2321	73 7 28	2328	71 22 10	2337
	SUN	E.	112 47 37	2552	111 7 36	2559	109 27 45	2567	107 48 5	2575
24	Fomalhaut	W.	79 21 27	2761	80 56 46	2765	82 32 0	2770	84 7 7	2776
	α Pegasi	W.	61 59 23	2514	63 40 17	2516	65 21 8	2519	67 1 55	2522
	MARS	E.	38 51 36	2532	37 11 7	2544	35 30 55	2556	33 51 0	2569
	Pollux	E.	60 38 48	2419	58 55 40	2432	57 12 51	2445	55 30 21	2460
	JUPITER	E.	62 38 48	2382	60 54 47	2391	59 11 0	2401	57 27 27	2411
	SUN	E.	99 32 36	2618	97 54 6	2628	96 15 49	2637	94 37 45	2646
25	Fomalhaut	W.	92 0 21	2819	93 34 24	2830	95 8 13	2841	96 41 47	2854
	α Pegasi	W.	75 24 19	2549	77 4 24	2556	78 44 19	2563	80 24 5	2571
	α Arietis	W.	31 49 47	2610	33 28 29	2597	35 7 28	2588	36 46 39	2582
	Pollux	E.	47 3 21	2545	45 23 11	2565	43 43 28	2587	42 4 15	2610
	JUPITER	E.	48 53 20	2464	47 11 16	2475	45 29 28	2487	43 47 56	2498
	SUN	E.	86 30 36	2695	84 53 50	2705	83 17 17	2715	81 40 57	2725
26	Fomalhaut	W.	104 25 14	2929	105 56 56	2946	107 28 16	2965	108 59 12	2965
	α Pegasi	W.	88 40 10	2613	90 18 47	2622	91 57 12	2632	93 35 24	2642
	α Arietis	W.	45 3 52	2576	46 43 20	2577	48 22 46	2580	50 2 8	2584
	Pollux	E.	33 56 59	2761	32 21 40	2801	30 47 14	2848	29 13 48	2900
	JUPITER	E.	35 24 30	2563	33 44 44	2577	32 5 18	2592	30 26 12	2609
	SUN	E.	73 42 40	2776	72 7 41	2786	70 32 55	2796	68 58 22	2807
27	α Arietis	W.	58 17 31	2609	59 56 14	2615	61 34 49	2621	63 13 15	2628
	Aldebaran	W.	24 32 48	2542	26 13 3	2548	27 53 9	2555	29 33 6	2562
	SATURN	W.	23 20 31	2536	25 0 54	2544	26 41 6	2553	28 21 6	2562
	SUN	E.	61 8 59	2858	59 35 46	2868	58 2 46	2879	56 30 0	2889
28	α Arietis	W.	71 23 6	2663	73 0 35	2671	74 37 54	2679	76 15 2	2686
	Aldebaran	W.	37 50 18	2601	39 29 12	2609	41 7 55	2617	42 46 27	2625
	SATURN	W.	36 38 3	2605	38 16 51	2614	39 55 27	2623	41 33 51	2632
	SUN	E.	48 49 27	2942	47 18 1	2952	45 46 48	2962	44 15 48	2973
29	α Arietis	W.	84 18 4	2728	85 54 7	2736	87 29 59	2744	89 5 40	2753
	Aldebaran	W.	50 56 19	2666	52 33 44	2675	54 10 57	2683	55 47 59	2692
	SATURN	W.	49 42 54	2675	51 20 8	2683	52 57 10	2692	54 34 0	2701
	SUN	E.	36 44 16	3030	35 14 41	3042	33 45 20	3054	32 16 14	3067
30	α Arietis	W.	97 1 9	2798	98 35 40	2806	100 9 58	2817	101 44 4	2826
	Aldebaran	W.	63 50 18	2734	65 26 12	2743	67 1 55	2751	68 37 27	2760
	SATURN	W.	62 35 20	2744	64 11 2	2752	65 46 33	2761	67 21 52	2769
	SUN	E.	24 54 54	3141	23 27 34	3159	22 0 36	3179	20 34 2	3302

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	Pollux	E.	81° 36′ 56″	2298	79° 50′ 53″	2305	78° 5′ 1″	2313	76° 19′ 20″	2322
	Jupiter	E.	83 43 8	2285	81 56 46	2291	80 10 33	2298	78 24 30	2305
	Sun	E.	119 29 19	2525	117 48 40	2531	116 8 10	2538	114 27 49	2544
23	Fomalhaut	W.	72 59 43	2755	74 35 10	2754	76 10 38	2756	77 46 4	2758
	α Pegasi	W.	55 15 42	2514	56 56 35	2512	58 37 31	2512	60 18 27	2512
	Aldebaran	E.	24 14 58	2293	22 28 48	2306	20 42 57	2320	18 57 27	2336
	Saturn	E.	25 3 29	2283	23 17 5	2292	21 30 54	2301	19 44 56	2311
	Mars	E.	45 36 4	2489	43 54 35	2499	42 13 20	2509	40 32 20	2521
	Pollux	E.	67 34 16	2371	65 49 59	2382	64 5 58	2393	62 22 14	2406
	Jupiter	E.	69 37 4	2346	67 52 11	2354	66 7 30	2363	64 23 2	2373
	Sun	E.	106 8 36	2583	104 29 18	2592	102 50 12	2601	101 11 18	2610
24	Fomalhaut	W.	85 42 6	2783	87 16 56	2791	88 51 36	2799	90 26 5	2809
	α Pegasi	W.	68 42 37	2527	70 23 13	2531	72 3 43	2537	73 44 5	2543
	Mars	E.	32 11 23	2583	30 32 5	2598	28 53 7	2613	27 14 30	2631
	Pollux	E.	53 48 12	2475	52 6 24	2491	50 24 58	2509	48 43 57	2527
	Jupiter	E.	55 44 8	2421	54 1 4	2431	52 18 14	2442	50 35 39	2453
	Sun	E.	92 59 53	2656	91 22 14	2666	89 44 48	2675	88 7 35	2686
25	Fomalhaut	W.	98 15 5	2867	99 48 6	2882	101 20 48	2897	102 53 11	2912
	α Pegasi	W.	82 3 40	2578	83 43 5	2587	85 22 18	2595	87 1 20	2604
	α Arietis	W.	38 25 58	2578	40 5 23	2575	41 44 52	2574	43 24 22	2574
	Pollux	E.	40 25 34	2635	38 47 27	2663	37 9 57	2692	35 33 6	2725
	Jupiter	E.	42 6 40	2510	40 25 41	2522	38 44 59	2535	37 4 35	2549
	Sun	E.	80 4 51	2735	78 28 58	2746	76 53 19	2756	75 17 53	2766
26	Fomalhaut	W.	110 29 44	3005	111 59 50	3028	113 29 28	3051	114 58 38	3076
	α Pegasi	W.	95 13 22	2652	96 51 6	2663	98 28 36	2673	100 5 52	2684
	α Arietis	W.	51 41 25	2587	53 20 37	2593	54 59 42	2598	56 38 40	2603
	Pollux	E.	27 41 29	2961	26 10 27	3031	24 40 53	3115	23 13 2	3215
	Jupiter	E.	28 47 29	2626	27 9 10	2646	25 31 17	2667	23 53 53	2690
	Sun	E.	67 24 3	2817	65 49 57	2827	64 16 4	2838	62 42 25	2848
27	α Arietis	W.	64 51 32	2635	66 29 40	2642	68 7 38	2649	69 45 27	2656
	Aldebaran	W.	31 12 53	2569	32 52 30	2577	34 31 57	2585	36 11 13	2593
	Saturn	W.	30 0 53	2571	31 40 28	2579	33 19 52	2587	34 59 4	2597
	Sun	E.	54 57 27	2899	53 25 7	2909	51 53 0	2920	50 21 7	2931
28	α Arietis	W.	77 52 0	2695	79 28 47	2702	81 5 24	2710	82 41 50	2719
	Aldebaran	W.	44 24 48	2633	46 2 58	2642	47 40 56	2650	49 18 43	2658
	Saturn	W.	43 12 3	2641	44 50 3	2649	46 27 52	2657	48 5 29	2666
	Sun	E.	42 45 2	2985	41 14 30	2995	39 44 11	3006	38 14 6	3018
29	α Arietis	W.	90 41 9	2763	92 16 26	2771	93 51 32	2780	95 26 26	2788
	Aldebaran	W.	57 24 49	2701	59 1 28	2709	60 37 56	2717	62 14 13	2726
	Saturn	W.	56 10 39	2710	57 47 6	2718	59 23 22	2726	60 59 27	2735
	Sun	E.	30 47 24	3080	29 18 50	3094	27 50 33	3109	26 22 34	3124
30	α Arietis	W.	103 17 58	2836	104 51 39	2845	106 25 8	2855	107 58 24	2866
	Aldebaran	W.	70 12 47	2769	71 47 56	2777	73 22 54	2785	74 57 41	2794
	Saturn	W.	68 57 0	2778	70 31 57	2787	72 6 42	2795	73 41 16	2804
	Sun	E.	19 7 55	3227	17 42 18	3257	16 17 16	3293	14 52 56	3338

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	10 41 10.90	9.076	N. 8 19 17.6	-54.42	15 53.62	64.41	0 2.85	0.779
Sun.	2	10 44 48.59	9.063	7 57 27.2	54.75	15 53.85	64.37	0 21.68	0.792
Mon.	3	10 48 25.99	9.052	7 35 29.1	55.08	15 54.09	64.33	0 40.78	0.803
Tues.	4	10 52 3.11	9.041	7 13 23.6	-55.38	15 54.33	64.29	1 0.15	0.814
Wed.	5	10 55 39.99	9.031	6 51 11.2	55.66	15 54.57	64.26	1 19.77	0.824
Thur.	6	10 59 16.63	9.022	6 28 52.1	55.94	15 54.82	64.23	1 39.63	0.833
Frid.	7	11 2 53.03	9.013	6 6 26.6	-56.19	15 55.07	64.20	1 59.72	0.842
Sat.	8	11 6 29.23	9.004	5 43 55.1	56.43	15 55.32	64.17	2 20.02	0.850
Sun.	9	11 10 5.24	8.996	5 21 18.1	56.66	15 55.57	64.14	2 40.51	0.858
Mon.	10	11 13 41.07	8.990	4 58 35.8	-56.87	15 55.82	64.12	3 1.17	0.865
Tues.	11	11 17 16.76	8.984	4 35 48.3	57.06	15 56.07	64.10	3 21.98	0.871
Wed.	12	11 20 52.32	8.979	4 12 56.1	57.24	15 56.33	64.08	3 42.92	0.876
Thur.	13	11 24 27.75	8.975	3 49 59.6	-57.42	15 56.59	64.07	4 3.98	0.880
Frid.	14	11 28 3.08	8.972	3 26 58.9	57.58	15 56.85	64.06	4 25.14	0.864
Sat.	15	11 31 38.35	8.969	3 3 54.5	57.73	15 57.11	64.05	4 46.36	0.886
Sun.	16	11 35 13.59	8.968	2 40 46.8	-57.87	15 57.37	64.05	5 7.62	0.887
Mon.	17	11 38 48.81	8.968	2 17 35.9	58.00	15 57.64	64.05	5 28.89	0.887
Tues.	18	11 42 24.04	8.969	1 54 22.1	58.13	15 57.90	64.05	5 50.17	0.886
Wed.	19	11 45 59.29	8.970	1 31 5.8	-58.22	15 58.16	64.06	6 11.40	0.885
Thur.	20	11 49 34.59	8.973	1 7 47.4	58.30	15 58.42	64.07	6 32 61	0.882
Frid.	21	11 53 9.95	8.976	0 44 27.3	58.37	15 58.69	64.08	6 53.74	0.879
Sat.	22	11 56 45.41	8.981	N. 0 21 5.5	-58.42	15 58.95	64.09	7 14.77	0.874
Sun.	23	12 0 20.99	8.986	S. 0 2 17.6	58.46	15 59.22	64.11	7 35.67	0.869
Mon.	24	12 3 56.72	8.993	0 25 41.4	58.49	15 59.48	64.13	7 56.44	0.863
Tues.	25	12 7 32.61	8.999	0 49 5.6	-58.50	15 59.75	64.15	8 17.04	0.856
Wed.	26	12 11 8.69	9.007	1 12 30.1	58.50	16 0.02	64.17	8 37.46	0.848
Thur.	27	12 14 44.97	9.016	1 35 54.4	58.49	16 0.29	64.20	8 57.68	0.839
Frid.	28	12 18 21.47	9.026	1 59 18.2	-58.46	16 0.56	64.23	9 17.69	0.829
Sat.	29	12 21 58.20	9.036	2 22 41.0	58.41	16 0.83	64.27	9 37.45	0.819
Sun.	30	12 25 35.20	9.046	2 46 2.5	58.36	16 1.10	64.31	9 56.95	0.809
Mon.	31	12 29 12.47	9.058	S. 3 9 22 3	-58.28	16 1.38	64.35	10 16.18	0.797

Note.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.
The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	10 41 10.91	9.078	N. 8 19 17.6	-54.43	0 2.85	0.779	10 41 13.76
Sun.	2	10 44 48.64	9.065	7 57 26.9	54.76	0 21.68	0 792	10 45 10.32
Mon.	3	10 48 26.09	9.054	7 35 28.5	55.09	0 40.79	0.803	10 49 6.87
Tues.	4	10 52 3.26	9.043	7 13 22.7	-55.39	1 0.16	0.814	10 53 3.42
Wed.	5	10 55 40.19	9.033	6 51 10.0	55.67	1 19.78	0.824	10 56 59.97
Thur.	6	10 59 16.88	9.024	6 28 50.6	55.95	1 39.65	0.833	11 0 56.53
Frid.	7	11 2 53.33	9.015	6 6 24.8	-56.20	1 59.75	0.842	11 4 53.08
Sat.	8	11 6 29.58	9.007	5 43 53.0	56.44	2 20.05	0.850	11 8 49.63
Sun.	9	11 10 5.64	8.998	5 21 15.7	56.67	2 40.54	0.858	11 12 46.18
Mon.	10	11 13 41.52	8.992	4 58 33.0	-56.88	3 1.22	0.865	11 16 42.74
Tues.	11	11 17 17.26	8.986	4 35 45.1	57.07	3 22.03	0.871	11 20 39.29
Wed.	12	11 20 52.87	8.981	4 12 52.6	57.26	3 42.97	0.876	11 24 35.84
Thur.	13	11 24 28.36	8.977	3 49 55.7	-57.44	4 4.03	0.880	11 28 32.39
Frid.	14	11 28 3.74	8.973	3 26 54.7	57.60	4 25.20	0.884	11 32 28.94
Sat.	15	11 31 39.07	8.971	3 3 50.0	57.75	4 46.42	0.886	11 36 25.49
Sun.	16	11 35 14.36	8.970	2 40 41.9	-57.89	5 7 69	0.887	11 40 22.05
Mon.	17	11 38 49.63	8.970	2 17 30.6	58.02	5 28.97	0.887	11 44 18.60
Tues.	18	11 42 24.91	8.971	1 54 16.5	58.13	5 50.25	0.886	11 48 15.15
Wed.	19	11 46 0.21	8.972	1 30 59.9	-58.23	6 11.49	0.885	11 52 11.70
Thur.	20	11 49 35.56	8.975	1 7 41.1	58 32	6 32.70	0.882	11 56 8.26
Frid.	21	11 53 10.97	8.978	0 44 20.6	58.39	6 53.84	0.879	12 0 4.81
Sat.	22	11 56 46.49	8.983	N. 0 20 58.5	-58.44	7 14.87	0.874	12 4 1.36
Sun.	23	12 0 22.13	8.988	S. 0 2 24.9	58.49	7 35.78	0.869	12 7 57 91
Mon.	24	12 3 57.92	8.995	0 25 49.1	58.51	7 56.55	0.863	12 11 54.47
Tues.	25	12 7 33.86	9.001	0 49 13.7	-58.52	8 17.16	0.856	12 15 51.02
Wed.	26	12 11 9.99	9.009	1 12 38.5	58.52	8 37.58	0.848	12 19 47.57
Thur.	27	12 14 46.32	9.018	1 36 3.1	58.51	8 57.80	0.839	12 23 44.12
Frid.	28	12 18 22.87	9.028	1 59 27.2	-58.48	9 17.81	0.829	12 27 40.68
Sat.	29	12 21 59.65	9.038	2 22 50.3	58.43	9 37.58	0.819	12 31 37.23
Sun.	30	12 25 36.70	9.048	2 46 12.1	58.38	9 57.08	0.809	12 35 33.78
Mon.	31	12 29 14.02	9.060	S. 3 9 32.1	-58.30	10 16.31	0.797	12 39 30.33

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 Hour,
+ 9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	244	158 40 49.9	40 5.3	145.32	— 0.78	0.0037987	- 43.5	13 16 35.38
2	245	159 38 58.5	38 13.8	145.39	0.70	0.0036936	44.2	13 12 39.47
3	246	160 37 8.8	36 24.0	145.46	0.60	0.0035867	44.9	13 8 43.56
4	247	161 35 20.7	34 35.8	145.53	— 0.48	0.0034781	- 45.6	13 4 47.66
5	248	162 33 34.2	32 49.2	145.59	0.36	0.0033679	46.2	13 0 51.75
6	249	163 31 49.2	31 4.2	145.66	0.23	0.0032562	46.8	12 56 55.84
7	250	164 30 5.9	29 20.8	145.73	— 0.09	0.0031431	- 47.4	12 52 59.94
8	251	165 28 24.1	27 38.9	145.79	+ 0.03	0.0030288	47.8	12 49 4.04
9	252	166 26 43.8	25 58.5	145.85	0.13	0.0029135	48.2	12 45 8.13
10	253	167 25 5.0	24 19.6	145.91	+ 0.22	0.0027973	- 48.5	12 41 12.22
11	254	168 23 27.8	22 42.3	145.98	0.28	0.0026804	48.8	12 37 16.32
12	255	169 21 52.2	21 6.7	146.05	0.30	0.0025629	49.0	12 33 20.41
13	256	170 20 18.3	19 32.7	146.12	+ 0.29	0.0024450	- 49.2	12 29 24.50
14	257	171 18 46.1	18 0.4	146.19	0.24	0.0023267	49.3	12 25 28.59
15	258	172 17 15.6	16 29.8	146.27	0.18	0.0022083	49.4	12 21 32.68
16	259	173 15 46.9	15 1.0	146.34	+ 0.09	0.0020897	- 49.5	12 17 36.78
17	260	174 14 20.1	13 34.2	146.42	— 0.02	0.0019710	49.5	12 13 40.87
18	261	175 12 55.3	12 9.3	146.50	0.14	0.0018522	49.5	12 9 44.96
19	262	176 11 32.4	10 46.3	146.59	— 0.27	0.0017334	- 49.5	12 5 49.06
20	263	177 10 11.6	9 25.4	146.68	0.41	0.0016144	49.5	12 1 53.16
21	264	178 8 53.1	8 6.8	146.77	0.53	0.0014954	49.6	11 57 57.25
22	265	179 7 36.8	6 50.4	146.86	— 0.66	0.0013763	- 49.7	11 54 1.34
23	266	180 6 22.7	5 36.2	146.96	0.76	0.0012569	49.8	11 50 5.43
24	267	181 5 10.8	4 24.2	147.05	0.83	0.0011371	50.0	11 46 9.53
25	268	182 4 1.2	3 14.5	147.15	— 0.87	0.0010169	- 50.2	11 42 13.62
26	269	183 2 53.9	2 7.1	147.24	0.87	0.0008962	50.4	11 38 17.71
27	270	184 1 48.9	1 2.1	147.34	0.86	0.0007748	50.7	11 34 21.80
28	271	184 60 46.2	59 59.3	147.43	— 0.82	0.0006527	- 51.0	11 30 25.90
29	272	185 59 45.7	58 58.7	147.52	0.75	0.0005299	51.3	11 26 29.99
30	273	186 58 47.3	58 0.2	147.61	0.66	0.0004064	51.6	11 22 34.08
31	274	187 57 51.0	57 3.8	147.69	— 0.54	0.0002820	- 52.0	11 18 38.18

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 5.4	15 2.0	55 15.8	−1.07	55 3.3	−1.01	δ		29.4
2	14 58.8	14 55.9	54 51.7	0.93	54 40.9	0.85	0 33.3	1.81	0.9
3	14 53.2	14 51.0	54 31.3	0.75	54 22.9	0.64	1 16.5	1.79	1.9
4	14 49.1	14 47.6	54 16.0	−0.52	54 10.6	−0.37	1 59.5	1.80	2.9
5	14 46.6	14 46.2	54 7.0	−0.22	54 5.3	−0.06	2 42.8	1.82	3.9
6	14 46.3	14 47.0	54 5.7	+0.12	54 8.2	+0.31	3 27.1	1.87	4.9
7	14 48.3	14 50.3	54 13.1	+0.51	54 20.4	+0.71	4 12.6	1.93	5.9
8	14 52.9	14 56.2	54 30.1	0.91	54 42.3	1.12	4 59.6	1.99	6.9
9	15 0.3	15 4.9	54 57.1	1.33	55 14.2	1.52	5 48.2	2.06	7.9
10	15 10.2	15 16.1	55 33.7	+1.72	55 55.3	+1.88	6 38.3	2.11	8.9
11	15 22.5	15 29.4	56 18.9	2.03	56 44.2	2.16	7 29.5	2.16	9.9
12	15 36.6	15 44.1	57 10.7	2.25	57 38.1	2.31	8 21.6	2.18	10.9
13	15 51.7	15 59.2	58 5.9	+2.32	58 33.4	+2.27	9 14.2	2.20	11.9
14	16 6.4	16 13.3	59 0.1	2.18	59 25.4	2.03	10 7.1	2.21	12.9
15	16 19.6	16 25.2	59 48.5	1.82	60 8.9	1.58	11 0.4	2.23	13.9
16	16 29.8	16 33.4	60 26.0	+1.28	60 39.3	+0.94	11 54.4	2.27	14.9
17	16 35.9	16 37.2	60 48.5	+0.58	60 53.3	+0.22	12 49.3	2.31	15.9
18	16 37.4	16 36.4	60 53.8	−0.13	60 50.0	−0.48	13 45.4	2.37	16.9
19	16 34.2	16 31.1	60 42.1	−0.81	60 30.6	−1.09	14 42.8	2.41	17.9
20	16 27.1	16 22.4	60 15.9	1.34	59 58.6	1.53	15 40.9	2.43	18.9
21	16 17.1	16 11.4	59 39.2	1.69	59 18.2	1.80	16 39.1	2.41	19.9
22	16 5.4	15 59.3	58 56.2	−1.86	58 33.8	−1.87	17 36.2	2.34	20.9
23	15 53.1	15 47.0	58 11.2	1.87	57 48.9	1.84	18 31.4	2.25	21.9
24	15 41.1	15 35.4	57 27.1	1.78	57 6.1	1.72	19 24.1	2.13	22.9
25	15 29.9	15 24.7	56 46.0	−1.63	56 27.0	−1.54	20 14.0	2.02	23.9
26	15 19.9	15 15.3	56 9.1	1.45	55 52.3	1.35	21 1.5	1.93	24.9
27	15 11.0	15 7.1	55 36.7	1.25	55 22.3	1.16	21 46.9	1.85	25.9
28	15 3.5	15 0.2	55 9.0	−1.07	54 56.8	−0.97	22 30.8	1.81	26.9
29	14 57.2	14 54.4	54 45.7	0.88	54 35.7	0.79	23 13.9	1.79	27.9
30	14 52.0	14 49.9	54 26.8	0.70	54 19.0	0.61	23 56.8	1.79	28.9
31	14 48.1	14 46.6	54 12.3	−0.51	54 6.8	−0.41	δ		0.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.					**MONDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 30 51.23	1.9659	N. 4 47 26.3	10.020	0	12 3 22.59	1.9041	S. 3 16 29.2	9.878
1	10 32 49.12	1.9637	4 37 24.7	10.034	1	12 5 16.83	1.9038	3 26 21.3	9.858
2	10 34 46.88	1.9616	4 27 22.3	10.047	2	12 7 11.05	1.9036	3 36 12.2	9.838
3	10 36 44.51	1.9594	4 17 19.1	10.059	3	12 9 5.26	1.9033	3 46 1.9	9.818
4	10 38 42.01	1.9573	4 7 15.2	10.070	4	12 10 59.45	1.9031	3 55 50.4	9.797
5	10 40 39.38	1.9552	3 57 10.7	10.081	5	12 12 53.63	1.9029	4 5 37.6	9.776
6	10 42 36.63	1.9532	3 47 5.5	10.092	6	12 14 47.80	1.9028	4 15 23.5	9.753
7	10 44 33.77	1.9513	3 36 59.7	10.101	7	12 16 41.96	1.9027	4 25 8.0	9.730
8	10 46 30.79	1.9493	3 26 53.4	10.109	8	12 18 36.12	1.9026	4 34 51.1	9.707
9	10 48 27.69	1.9474	3 16 46.6	10.117	9	12 20 30.27	1.9025	4 44 32.8	9.682
10	10 50 24.48	1.9457	3 6 39.3	10.125	10	12 22 24.42	1.9025	4 54 13.0	9.657
11	10 52 21.17	1.9439	2 56 31.6	10.131	11	12 24 18.57	1.9026	5 3 51.7	9.632
12	10 54 17.75	1.9421	2 46 23.6	10.136	12	12 26 12.73	1.9027	5 13 28.8	9.606
13	10 56 14.22	1.9403	2 36 15.3	10.141	13	12 28 6.90	1.9028	5 23 4.4	9.580
14	10 58 10.59	1.9387	2 26 6.7	10.146	14	12 30 1.07	1.9029	5 32 38.4	9.553
15	11 0 6.86	1.9370	2 15 57.8	10.149	15	12 31 55.25	1.9031	5 42 10.7	9.525
16	11 2 3.03	1.9353	2 5 48.8	10.152	16	12 33 49.44	1.9033	5 51 41.4	9.497
17	11 3 59.10	1.9337	1 55 39.6	10.154	17	12 35 43.65	1.9036	6 1 10.3	9.468
18	11 5 55.08	1.9322	1 45 30.3	10.156	18	12 37 37.88	1.9039	6 10 37.5	9.438
19	11 7 50.97	1.9307	1 35 20.9	10.156	19	12 39 32.12	1.9043	6 20 2.9	9.408
20	11 9 46.77	1.9292	1 25 11.6	10.155	20	12 41 26.39	1.9047	6 29 26.5	9.378
21	11 11 42.48	1.9278	1 15 2.3	10.154	21	12 43 20.68	1.9051	6 38 48.2	9.347
22	11 13 38.11	1.9265	1 4 53.1	10.153	22	12 45 15.00	1.9056	6 48 8.1	9.315
23	11 15 33.66	1.9252	N. 0 54 44.0	10.151	23	12 47 9.35	1.9060	S. 6 57 26.0	9.282
	SUNDAY 2.					**TUESDAY 4.**			
0	11 17 29.13	1.9239	N. 0 44 35.0	10.148	0	12 49 3.72	1.9065	S. 7 6 42.0	9.250
1	11 19 24.52	1.9226	0 34 26.2	10.144	1	12 50 58.13	1.9071	7 15 56.0	9.217
2	11 21 19.84	1.9213	0 24 17.7	10.140	2	12 52 52.57	1.9076	7 25 8.0	9.182
3	11 23 15.08	1.9201	0 14 9.4	10.136	3	12 54 47.04	1.9082	7 34 17.9	9.147
4	11 25 10.25	1.9190	N. 0 4 1.4	10.130	4	12 56 41.55	1.9089	7 43 25.7	9.112
5	11 27 5.36	1.9179	S. 0 6 6.2	10.123	5	12 58 36.11	1.9097	7 52 31.4	9.077
6	11 29 0.40	1.9168	0 16 13.4	10.117	6	13 0 30.71	1.9104	8 1 34.9	9.040
7	11 30 55.38	1.9158	0 26 20.2	10.109	7	13 2 25.35	1.9111	8 10 36.2	9.003
8	11 32 50.30	1.9148	0 36 26.5	10.100	8	13 4 20.04	1.9119	8 19 35.3	8.966
9	11 34 45.16	1.9138	0 46 32.2	10.091	9	13 6 14.78	1.9127	8 28 32.2	8.928
10	11 36 39.96	1.9128	0 56 37.4	10.082	10	13 8 9.57	1.9136	8 37 26.7	8.889
11	11 38 34.70	1.9119	1 6 42.0	10.071	11	13 10 4.41	1.9144	8 46 18.9	8.851
12	11 40 29.39	1.9111	1 16 45.9	10.060	12	13 11 59.30	1.9153	8 55 8.8	8.812
13	11 42 24.04	1.9104	1 26 49.2	10.048	13	13 13 54.25	1.9163	9 3 56.3	8.771
14	11 44 18.64	1.9096	1 36 51.7	10.036	14	13 15 49.26	1.9173	9 12 41.3	8.730
15	11 46 13.19	1.9088	1 46 53.5	10.023	15	13 17 44.33	1.9184	9 21 23.9	8.689
16	11 48 7.70	1.9082	1 56 54.5	10.009	16	13 19 39.47	1.9195	9 30 4.0	8.648
17	11 50 2.18	1.9076	2 6 54.6	9.995	17	13 21 34.67	1.9205	9 38 41.6	8.606
18	11 51 56.62	1.9070	2 16 53.9	9.981	18	13 23 29.93	1.9216	9 47 16.7	8.563
19	11 53 51.02	1.9064	2 26 52.3	9.965	19	13 25 25.26	1.9227	9 55 49.2	8.519
20	11 55 45.39	1.9059	2 36 49.7	9.948	20	13 27 20.66	1.9239	10 4 19.0	8.475
21	11 57 39.73	1.9054	2 46 46.1	9.932	21	13 29 16.13	1.9252	10 12 46.2	8.431
22	11 59 34.04	1.9050	2 56 41.5	9.915	22	13 31 11.68	1.9264	10 21 10.7	8.386
23	12 1 28.33	1.9046	3 6 35.9	9.897	23	13 33 7.30	1.9277	10 29 32.5	8.340
24	12 3 22.59	1.9041	S. 3 16 29.2	9.878	24	13 35 3.00	1.9290	S. 10 37 51.5	8.294

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 5.					FRIDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 35 3.00	1.9290	S. 10 37 51.5	8.294	0	15 9 38.65	2.0210	S. 16 13 10.9	5.483
1	13 36 58.78	1.9303	10 46 7.8	8.248	1	15 11 39.98	2.0233	16 18 37.8	5.412
2	13 38 54.64	1.9317	10 54 21.3	8.201	2	15 13 41.45	2.0257	16 24 0.4	5.341
3	13 40 50.58	1.9331	11 2 31.9	8.153	3	15 15 43.06	2.0281	16 29 18.7	5.269
4	13 42 46.61	1.9345	11 10 39.7	8.105	4	15 17 44.82	2.0305	16 34 32.7	5.197
5	13 44 42.72	1.9359	11 18 44.5	8.056	5	15 19 46.72	2.0329	16 39 42.4	5.125
6	13 46 38.92	1.9374	11 26 46.4	8.007	6	15 21 48.77	2.0353	16 44 47.7	5.052
7	13 48 35.21	1.9389	11 34 45.4	7.958	7	15 23 50.96	2.0377	16 49 48.6	4.978
8	13 50 31.59	1.9404	11 42 41.4	7.908	8	15 25 53.30	2.0402	16 54 45.1	4.904
9	13 52 28.06	1.9420	11 50 34.3	7.857	9	15 27 55.79	2.0427	16 59 37.1	4.829
10	13 54 24.63	1.9436	11 58 24.2	7.806	10	15 29 58.43	2.0452	17 4 24.6	4.754
11	13 56 21.30	1.9452	12 6 11.0	7.753	11	15 32 1.21	2.0476	17 9 7.6	4.679
12	13 58 18.06	1.9469	12 13 54.6	7.701	12	15 34 4.14	2.0501	17 13 46.1	4.603
13	14 0 14.92	1.9486	12 21 35.1	7.648	13	15 36 7.22	2.0526	17 18 20.0	4.527
14	14 2 11.89	1.9503	12 29 12.4	7.595	14	15 38 10.45	2.0551	17 22 49.3	4.450
15	14 4 8.96	1.9520	12 36 46.5	7.542	15	15 40 13.83	2.0576	17 27 14.0	4.372
16	14 6 6.13	1.9537	12 44 17.4	7.487	16	15 42 17.36	2.0601	17 31 34.0	4.294
17	14 8 3.41	1.9555	12 51 45.0	7.432	17	15 44 21.04	2.0626	17 35 49.3	4.217
18	14 10 0.79	1.9573	12 59 9.3	7.377	18	15 46 24.87	2.0651	17 40 0.0	4.138
19	14 11 58.28	1.9591	13 6 30.3	7.322	19	15 48 28.85	2.0676	17 44 5.9	4.058
20	14 13 55.88	1.9609	13 13 47.9	7.265	20	15 50 32.98	2.0702	17 48 7.0	3.979
21	14 15 53.59	1.9628	13 21 2.1	7.208	21	15 52 37.27	2.0727	17 52 3.4	3.899
22	14 17 51.42	1.9647	13 28 12.9	7.151	22	15 54 41.70	2.0751	17 55 54.9	3.818
23	14 19 49.36	1.9667	S. 13 35 20.2	7.093	23	15 56 46.28	2.0777	S. 17 59 41.6	3.737
	THURSDAY 6.					SATURDAY 8.			
0	14 21 47.42	1.9687	S. 13 42 24.0	7.034	0	15 58 51.02	2.0802	S. 18 3 23.4	3.656
1	14 23 45.60	1.9706	13 49 24.3	6.976	1	16 0 55.91	2.0827	18 7 0.3	3.574
2	14 25 43.89	1.9725	13 56 21.1	6.917	2	16 3 0.95	2.0852	18 10 32.3	3.492
3	14 27 42.30	1.9745	14 3 14.3	6.857	3	16 5 6.14	2.0877	18 13 59.3	3.409
4	14 29 40.83	1.9765	14 10 3.9	6.796	4	16 7 11.48	2.0902	18 17 21.4	3.326
5	14 31 39.48	1.9786	14 16 49.8	6.734	5	16 9 16.97	2.0928	18 20 38.4	3.242
6	14 33 38.26	1.9807	14 23 32.0	6.672	6	16 11 22.62	2.0954	18 23 50.4	3.157
7	14 35 37.16	1.9828	14 30 10.5	6.611	7	16 13 28.42	2.0979	18 26 57.4	3.073
8	14 37 36.19	1.9849	14 36 45.3	6.549	8	16 15 34.37	2.1003	18 29 59.2	2.989
9	14 39 35.35	1.9871	14 43 16.4	6.487	9	16 17 40.46	2.1028	18 32 56.0	2.903
10	14 41 34.64	1.9892	14 49 43.7	6.423	10	16 19 46.70	2.1053	18 35 47.6	2.818
11	14 43 34.05	1.9913	14 56 7.1	6.358	11	16 21 53.10	2.1079	18 38 34.1	2.732
12	14 45 33.59	1.9934	15 2 26.7	6.294	12	16 23 59.65	2.1104	18 41 15.4	2.645
13	14 47 33.26	1.9957	15 8 42.4	6.229	13	16 26 6.35	2.1129	18 43 51.5	2.558
14	14 49 33.07	1.9979	15 14 54.2	6.164	14	16 28 13.20	2.1153	18 46 22.4	2.471
15	14 51 33.01	2.0002	15 21 2.1	6.098	15	16 30 20.19	2.1177	18 48 48.0	2.383
16	14 53 33.09	2.0024	15 27 6.0	6.032	16	16 32 27.33	2.1202	18 51 8.3	2.294
17	14 55 33.30	2.0047	15 33 5.9	5.965	17	16 34 34.62	2.1227	18 53 23.3	2.206
18	14 57 33.65	2.0070	15 39 1.8	5.897	18	16 36 42.06	2.1252	18 55 33.0	2.117
19	14 59 34.14	2.0092	15 44 53.6	5.829	19	16 38 49.64	2.1276	18 57 37.3	2.027
20	15 1 34.76	2.0115	15 50 41.3	5.762	20	16 40 57.37	2.1301	18 59 36.2	1.937
21	15 3 35.52	2.0139	15 56 25.0	5.693	21	16 43 5.25	2.1325	19 1 29.8	1.847
22	15 5 36.42	2.0162	16 2 4.5	5.623	22	16 45 13.27	2.1349	19 3 17.9	1.757
23	15 7 37.46	2.0186	16 7 39.8	5.553	23	16 47 21.44	2.1373	19 5 0.6	1.667
24	15 9 38.65	2.0210	S. 16 13 10.9	5.483	24	16 49 29.75	2.1397	S. 19 6 37.9	1.576

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 49 29.75	2.1397	S. 19 6 37.9	1.576
1	16 51 38.20	2.1421	19 8 9.7	1.484
2	16 53 46.80	2.1445	19 9 35.9	1.391
3	16 55 55.54	2.1468	19 10 56.6	1.299
4	16 58 4.41	2.1491	19 12 11.8	1.207
5	17 0 13.43	2.1515	19 13 21.4	1.113
6	17 2 22.59	2.1538	19 14 25.4	1.020
7	17 4 31.89	2.1561	19 15 23.8	0.926
8	17 6 41.32	2.1583	19 16 16.5	0.832
9	17 8 50.89	2.1606	19 17 3.6	0.737
10	17 11 0.60	2.1629	19 17 45.0	0.642
11	17 13 10.44	2.1652	19 18 20.7	0.548
12	17 15 20.42	2.1674	19 18 50.8	0.453
13	17 17 30.53	2.1696	19 19 15.1	0.357
14	17 19 40.77	2.1717	19 19 33.6	0.261
15	17 21 51.14	2.1739	19 19 46.4	0.165
16	17 24 1.64	2.1761	19 19 53.4	− 0.068
17	17 26 12.27	2.1782	19 19 54.6	+ 0.029
18	17 28 23.02	2.1803	19 19 49.9	0.126
19	17 30 33.90	2.1824	19 19 39.4	0.223
20	17 32 44.91	2.1845	19 19 23.1	0.321
21	17 34 56.04	2.1865	19 19 0.9	0.419
22	17 37 7.29	2.1886	19 18 32.8	0.517
23	17 39 18.67	2.1907	S. 19 17 58.8	0.616

MONDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 41 30.17	2.1927	S. 19 17 18.9	0.715
1	17 43 41.79	2.1946	19 16 33.0	0.814
2	17 45 53.52	2.1965	19 15 41.2	0.913
3	17 48 5.37	2.1985	19 14 43.5	1.012
4	17 50 17.34	2.2004	19 13 39.8	1.112
5	17 52 29.42	2.2023	19 12 30.1	1.211
6	17 54 41.62	2.2042	19 11 14.5	1.311
7	17 56 53.93	2.2061	19 9 52.8	1.412
8	17 59 6.35	2.2078	19 8 25.1	1.512
9	18 1 18.87	2.2096	19 6 51.4	1.612
10	18 3 31.50	2.2114	19 5 11.6	1.713
11	18 5 44.24	2.2132	19 3 25.8	1.813
12	18 7 57.09	2.2150	19 1 34.0	1.914
13	18 10 10.04	2.2167	18 59 36.1	2.016
14	18 12 23.09	2.2184	18 57 32.1	2.117
15	18 14 36.25	2.2201	18 55 22.0	2.219
16	18 16 49.50	2.2217	18 53 5.8	2.321
17	18 19 2.85	2.2233	18 50 43.5	2.422
18	18 21 16.30	2.2249	18 48 15.1	2.524
19	18 23 29.84	2.2265	18 45 40.6	2.626
20	18 25 43.48	2.2281	18 43 0.0	2.728
21	18 27 57.21	2.2296	18 40 13.3	2.830
22	18 30 11.03	2.2311	18 37 20.4	2.932
23	18 32 24.94	2.2325	18 34 21.4	3.034
24	18 34 38.93	2.2339	S. 18 31 16.3	3.136

TUESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 34 38.93	2.2339	S. 18 31 16.3	3.136
1	18 36 53.01	2.2354	18 28 5.1	3.238
2	18 39 7.18	2.2368	18 24 47.7	3.341
3	18 41 21.43	2.2382	18 21 24.2	3.443
4	18 43 35.76	2.2396	18 17 54.6	3.545
5	18 45 50.18	2.2410	18 14 18.8	3.647
6	18 48 4.68	2.2423	18 10 36.9	3.750
7	18 50 19.25	2.2435	18 6 48.8	3.852
8	18 52 33.90	2.2448	18 2 54.6	3.954
9	18 54 48.63	2.2461	17 58 54.3	4.056
10	18 57 3.43	2.2473	17 54 47.9	4.158
11	18 59 18.31	2.2486	17 50 35.3	4.261
12	19 1 33.26	2.2498	17 46 16.6	4.363
13	19 3 48.28	2.2509	17 41 51.8	4.464
14	19 6 3.37	2.2520	17 37 20.9	4.566
15	18 8 18.52	2.2531	17 32 43.8	4.668
16	19 10 33.74	2.2542	17 28 0.7	4.769
17	19 12 49.02	2.2553	17 23 11.5	4.871
18	19 15 4.37	2.2563	17 18 16.2	4.972
19	19 17 19.78	2.2573	17 13 14.8	5.073
20	19 19 35.25	2.2583	17 8 7.4	5.174
21	19 21 50.78	2.2593	17 2 53.9	5.276
22	19 24 6.37	2.2603	16 57 34.3	5.377
23	19 26 22.02	2.2613	S. 16 52 8.7	5.477

WEDNESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 28 37.73	2.2622	S. 16 46 37.1	5.577
1	19 30 53.49	2.2631	16 40 59.5	5.677
2	19 33 9.30	2.2640	16 35 15.9	5.777
3	19 35 25.17	2.2649	16 29 26.3	5.876
4	19 37 41.09	2.2657	16 23 30.8	5.975
5	19 39 57.06	2.2666	16 17 29.3	6.075
6	19 42 13.08	2.2674	16 11 21.8	6.174
7	19 44 29.15	2.2682	16 5 8.4	6.272
8	19 46 45.27	2.2690	15 58 49.2	6.369
9	19 49 1.43	2.2697	15 52 24.1	6.467
10	19 51 17.64	2.2705	15 45 53.1	6.565
11	19 53 33.89	2.2712	15 39 16.4	6.662
12	19 55 50.19	2.2720	15 32 33.7	6.758
13	19 58 6.53	2.2727	15 25 45.3	6.855
14	20 0 22.91	2.2734	15 18 51.1	6.952
15	20 2 39.34	2.2741	15 11 51.1	7.047
16	20 4 55.81	2.2747	15 4 45.4	7.142
17	20 7 12.31	2.2753	14 57 34.1	7.236
18	20 9 28.85	2.2760	14 50 17.1	7.331
19	20 11 45.43	2.2767	14 42 54.4	7.425
20	20 14 2.05	2.2773	14 35 26.1	7.517
21	20 16 18.71	2.2779	14 27 52.3	7.610
22	20 18 35.40	2.2785	14 20 12.9	7.702
23	20 20 52.13	2.2792	14 12 28.0	7.795
24	20 23 8.90	2.2797	S. 14 4 37.5	7.887

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 13.					**SATURDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 23 8.90	2.2797	S. 14 4 37.5	7.887	0	22 13 12.14	2.3076	S. 6 14 5.1	11.386
1	20 25 25.70	2.2802	13 56 41.5	7.977	1	22 15 30.62	2.3083	6 2 40.5	11.434
2	20 27 42.53	2.2808	13 48 40.2	8.067	2	22 17 49.14	2.3091	5 51 13.0	11.482
3	20 29 59.40	2.2814	13 40 33.5	8.157	3	22 20 7.71	2.3099	5 39 42.6	11.529
4	20 32 16.30	2.2819	13 32 21.4	8.246	4	22 22 26.33	2.3108	5 28 9.5	11.574
5	20 34 33.23	2.2825	13 24 4.0	8.335	5	22 24 45.01	2.3117	5 16 33.7	11.617
6	20 36 50.20	2.2831	13 15 41.2	8.423	6	22 27 3.74	2.3126	5 4 55.4	11.659
7	20 39 7.20	2.2836	13 7 13.2	8.510	7	22 29 22.52	2.3135	4 53 14.6	11.701
8	20 41 24.23	2.2841	12 58 40.0	8.597	8	22 31 41.36	2.3144	4 41 31.3	11.742
9	20 43 41.29	2.2846	12 50 1.6	8.682	9	22 34 0.25	2.3153	4 29 45.5	11.781
10	20 45 58.38	2.2851	12 41 18.1	8.767	10	22 36 19.20	2.3162	4 17 57.5	11.818
11	20 48 15.50	2.2857	12 32 29.5	8.852	11	22 38 38.20	2.3172	4 6 7.3	11.855
12	20 50 32.66	2.2862	12 23 35.8	8.937	12	22 40 57.26	2.3182	3 54 14.9	11.890
13	20 52 49.85	2.2867	12 14 37.1	9.020	13	22 43 16.38	2.3192	3 42 20.5	11.923
14	20 55 7.07	2.2872	12 5 33.4	9.102	14	22 45 35.56	2.3202	3 30 24.1	11.956
15	20 57 24.31	2.2876	11 56 24.8	9.184	15	22 47 54.81	2.3213	3 18 25.8	11.987
16	20 59 41.58	2.2882	11 47 11.3	9.266	16	22 50 14.12	2.3224	3 6 25.7	12.016
17	21 1 58.89	2.2887	11 37 52.9	9.347	17	22 52 33.50	2.3235	2 54 23.9	12.044
18	21 4 16.23	2.2892	11 28 29.7	9.426	18	22 54 52.94	2.3246	2 42 20.4	12.072
19	21 6 33.60	2.2897	11 19 1.8	9.504	19	22 57 12.45	2.3257	2 30 15.3	12.097
20	21 8 51.00	2.2902	11 9 29.2	9.582	20	22 59 32.03	2.3268	2 18 8.8	12.120
21	21 11 8.43	2.2907	10 59 51.9	9.660	21	23 1 51.67	2.3279	2 6 0.9	12.143
22	21 13 25.89	2.2913	10 50 10.0	9.736	22	23 4 11.38	2.3292	1 53 51.6	12.165
23	21 15 43.39	2.2919	S. 10 40 23.6	9.812	23	23 6 31.17	2.3304	S. 1 41 41.1	12.184
	FRIDAY 14.					**SUNDAY 16.**			
0	21 18 0.92	2.2924	S. 10 30 32.6	9.887	0	23 8 51.03	2.3316	S. 1 29 29.5	12.202
1	21 20 18.48	2.2929	10 20 37.1	9.961	1	23 11 10.96	2.3328	1 17 16.9	12.219
2	21 22 36.07	2.2934	10 10 37.3	10.033	2	23 13 30.97	2.3341	1 5 3.2	12.236
3	21 24 53.69	2.2940	10 0 33.2	10.104	3	23 15 51.06	2.3355	0 52 48.6	12.250
4	21 27 11.35	2.2946	9 50 24.8	10.176	4	23 18 11.23	2.3368	0 40 33.2	12.262
5	21 29 29.04	2.2951	9 40 12.1	10.247	5	23 20 31.48	2.3382	0 28 17.1	12.273
6	21 31 46.76	2.2957	9 29 55.2	10.316	6	23 22 51.81	2.3395	0 16 0.4	12.282
7	21 34 4.52	2.2962	9 19 34.2	10.384	7	23 25 12.22	2.3409	S. 0 3 43.2	12.291
8	21 36 22.31	2.2967	9 9 9.2	10.451	8	23 27 32.72	2.3423	N. 0 8 34.5	12.298
9	21 38 40.13	2.2973	8 58 40.1	10.517	9	23 29 53.30	2.3437	0 20 52.6	12.304
10	21 40 57.99	2.2980	8 48 7.1	10.582	10	23 32 13.97	2.3452	0 33 11.0	12.307
11	21 43 15.89	2.2986	8 37 30.2	10.647	11	23 34 34.72	2.3466	0 45 29.5	12.309
12	21 45 33.82	2.2992	8 26 49.4	10.711	12	23 36 55.56	2.3481	0 57 48.1	12.310
13	21 47 51.79	2.2998	8 16 4.9	10.773	13	23 39 16.49	2.3496	1 10 6.7	12.309
14	21 50 9.80	2.3005	8 5 16.7	10.834	14	23 41 37.51	2.3512	1 22 25.2	12.307
15	21 52 27.85	2.3012	7 54 24.8	10.894	15	23 43 58.63	2.3527	1 34 43.6	12.304
16	21 54 45.94	2.3018	7 43 29.4	10.953	16	23 46 19.84	2.3542	1 47 1.7	12.298
17	21 57 4.07	2.3024	7 32 30.5	11.011	17	23 48 41.14	2.3558	1 59 19.4	12.291
18	21 59 22.23	2.3031	7 21 28.1	11.068	18	23 51 2.54	2.3575	2 11 36.6	12.282
19	22 1 40.44	2.3038	7 10 22.3	11.124	19	23 53 24.04	2.3591	2 23 53.3	12.272
20	22 3 58.69	2.3046	6 59 13.2	11.178	20	23 55 45.63	2.3607	2 36 9.3	12.261
21	22 6 16.99	2.3053	6 48 0.9	11.232	21	23 58 7.32	2.3623	2 48 24.6	12.248
22	22 8 35.33	2.3060	6 36 45.4	11.284	22	0 0 29.11	2.3640	3 0 39.1	12.234
23	22 10 53.71	2.3068	6 25 26.8	11.336	23	0 2 51.00	2.3657	3 12 52.7	12.217
24	22 13 12.14	2.3076	S. 6 14 5.1	11.386	24	0 5 13.00	2.3675	N. 3 25 5.2	12.199

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 5 13.00	2.3675	N. 3 25 5.2	12.199
1	0 7 35.10	2.3692	3 37 16.6	12.180
2	0 9 57.30	2.3709	3 49 26.8	12.160
3	0 12 19.61	2.3727	4 1 35.8	12.138
4	0 14 42.03	2.3745	4 13 43.4	12.114
5	0 17 4.55	2.3763	4 25 49.5	12.088
6	0 19 27.18	2.3781	4 37 54.0	12.061
7	0 21 49.92	2.3799	4 49 56.8	12.032
8	0 24 12.77	2.3817	5 1 57.9	12.003
9	0 26 35.73	2.3836	5 13 57.2	11.972
10	0 28 58.80	2.3855	5 25 54.5	11.938
11	0 31 21.99	2.3874	5 37 49.8	11.903
12	0 33 45.29	2.3893	5 49 42.9	11.867
13	0 36 8.70	2.3912	6 1 33.8	11.829
14	0 38 32.23	2.3931	6 13 22.4	11.790
15	0 40 55.87	2.3949	6 25 8.6	11.749
16	0 43 19.62	2.3968	6 36 52.3	11.707
17	0 45 43.49	2.3988	6 48 33.4	11.663
18	0 48 7.48	2.4007	7 0 11.9	11.618
19	0 50 31.58	2.4027	7 11 47.6	11.571
20	0 52 55.80	2.4047	7 23 20.4	11.522
21	0 55 20.14	2.4067	7 34 50.2	11.472
22	0 57 44.60	2.4087	7 46 17.0	11.421
23	1 0 9.18	2.4107	N. 7 57 40.7	11.368

TUESDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 2 33.88	2.4127	N. 8 9 1.2	11.314
1	1 4 58.70	2.4146	8 20 18.4	11.258
2	1 7 23.63	2.4165	8 31 32.2	11.200
3	1 9 48.68	2.4185	8 42 42.4	11.141
4	1 12 13.85	2.4205	8 53 49.1	11.082
5	1 14 39.14	2.4224	9 4 52.2	11.020
6	1 17 4.54	2.4243	9 15 51.5	10.957
7	1 19 30.06	2.4263	9 26 47.0	10.892
8	1 21 55.70	2.4283	9 37 38.5	10.825
9	1 24 21.46	2.4303	9 48 26.0	10.758
10	1 26 47.34	2.4322	9 59 9.5	10.690
11	1 29 13.33	2.4342	10 9 48.8	10.619
12	1 31 39.44	2.4361	10 20 23.8	10.547
13	1 34 5.66	2.4380	10 30 54.5	10.475
14	1 36 32.00	2.4400	10 41 20.8	10.401
15	1 38 58.46	2.4419	10 51 42.6	10.325
16	1 41 25.03	2.4438	11 1 59.8	10.247
17	1 43 51.71	2.4457	11 12 12.3	10.169
18	1 46 18.51	2.4476	11 22 20.1	10.090
19	1 48 45.42	2.4494	11 32 23.1	10.009
20	1 51 12.44	2.4512	11 42 21.2	9.927
21	1 53 39.56	2.4529	11 52 14.2	9.843
22	1 56 6.79	2.4548	12 2 2.4	9.758
23	1 58 34.13	2.4566	12 11 45.3	9.672
24	2 1 1.58	2.4583	N.12 21 23.0	9.585

WEDNESDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 1 1.58	2.4583	N.12 21 23.0	9.585
1	2 3 29.13	2.4601	12 30 55.5	9.497
2	2 5 56.79	2.4618	12 40 22.6	9.407
3	2 8 24.55	2.4635	12 49 44.3	9.316
4	2 10 52.41	2.4652	12 59 0.5	9.224
5	2 13 20.37	2.4668	13 8 11.1	9.131
6	2 15 48.42	2.4683	13 17 16.2	9.037
7	2 18 16.57	2.4699	13 26 15.6	8.942
8	2 20 44.81	2.4715	13 35 9.2	8.845
9	2 23 13.15	2.4731	13 43 57.0	8.747
10	2 25 41.58	2.4745	13 52 38.9	8.649
11	2 28 10.09	2.4759	14 1 14.9	8.549
12	2 30 38.69	2.4773	14 9 44.8	8.446
13	2 33 7.37	2.4788	14 18 8.7	8.347
14	2 35 36.14	2.4802	14 26 26.4	8.244
15	2 38 4.99	2.4815	14 34 38.0	8.140
16	2 40 33.92	2.4827	14 42 43.3	8.036
17	2 43 2.92	2.4839	14 50 42.3	7.930
18	2 45 31.99	2.4851	14 58 34.9	7.823
19	2 48 1.13	2.4862	15 6 21.1	7.716
20	2 50 30.34	2.4874	15 14 0.8	7.608
21	2 52 59.62	2.4885	15 21 34.1	7.500
22	2 55 28.96	2.4895	15 29 0.8	7.389
23	2 57 58.36	2.4904	N.15 36 20.8	7.278

THURSDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 0 27.81	2.4913	N.15 43 34.1	7.166
1	3 2 57.32	2.4923	15 50 40.7	7.054
2	3 5 26.88	2.4931	15 57 40.6	6.942
3	3 7 56.49	2.4938	16 4 33.7	6.828
4	3 10 26.14	2.4946	16 11 19.9	6.713
5	3 12 55.84	2.4953	16 17 59.2	6.598
6	3 15 25.58	2.4959	16 24 31.6	6.482
7	3 17 55.35	2.4964	16 30 57.0	6.365
8	3 20 25.15	2.4970	16 37 15.4	6.247
9	3 22 54.99	2.4975	16 43 26.7	6.129
10	3 25 24.85	2.4979	16 49 30.9	6.011
11	3 27 54.73	2.4982	16 55 28.0	5.892
12	3 30 24.63	2.4985	17 1 18.0	5.773
13	3 32 54.55	2.4987	17 7 0.8	5.653
14	3 35 24.48	2.4989	17 12 36.4	5.532
15	3 37 54.42	2.4991	17 18 4.7	5.411
16	3 40 24.37	2.4992	17 23 25.7	5.289
17	3 42 54.32	2.4991	17 28 39.4	5.167
18	3 45 24.26	2.4990	17 33 45.8	5.045
19	3 47 54.20	2.4989	17 38 44.8	4.922
20	3 50 24.13	2.4987	17 43 36.4	4.799
21	3 52 54.05	2.4985	17 48 20.7	4.676
22	3 55 23.95	2.4982	17 52 57.6	4.552
23	3 57 53.83	2.4978	17 57 27.0	4.427
24	4 0 23.69	2.4974	N.18 1 48.9	4.303

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 0 23.69	2.4974	N.18 1 48.9	4.303
1	4 2 53.52	2.4969	18 6 3.3	4.178
2	4 5 23.32	2.4963	18 10 10.3	4.053
3	4 7 53.08	2.4957	18 14 9.8	3.928
4	4 10 22.81	2.4951	18 18 1.7	3.802
5	4 12 52.49	2.1943	18 21 46.1	3.677
6	4 15 22.12	2.4934	18 25 23.0	3.552
7	4 17 51.70	2.4925	18 28 52.3	3.426
8	4 20 21.22	2.4915	18 32 14.1	3.300
9	4 22 50.68	2.4905	18 35 28.3	3.174
10	4 25 20.08	2.4895	18 38 35.0	3.048
11	4 27 49.42	2.4884	18 41 34.1	2.922
12	4 30 18.69	2.4872	18 44 25.6	2.795
13	4 32 47.88	2.4858	18 47 9.5	2.669
14	4 35 16.99	2.4844	18 49 45.9	2.543
15	4 37 46.01	2.4830	18 52 14.7	2.417
16	4 40 14.95	2.4815	18 54 35.9	2.290
17	4 42 43.79	2.4799	18 56 49.5	2.164
18	4 45 12.54	2.4783	18 58 55.6	2.038
19	4 47 41.19	2.4767	19 0 54.1	1.912
20	4 50 9.74	2.4750	19 2 45.1	1.787
21	4 52 38.19	2.4732	19 4 28.6	1.662
22	4 55 6.52	2.4713	19 6 4.5	1.536
23	4 57 34.74	2.4693	N.19 7 32.9	1.411

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 0 2.84	2.4673	N.19 8 53.8	1.286
1	5 2 30.82	2.4652	19 10 7.2	1.161
2	5 4 58.67	2.4631	19 11 13.1	1.037
3	5 7 26.39	2.4609	19 12 11.6	0.912
4	5 9 53.98	2.4587	19 13 2.6	0.788
5	5 12 21.43	2.4564	19 13 46.2	0.664
6	5 14 48.75	2.4541	19 14 22.3	0.541
7	5 17 15.92	2.4516	19 14 51.1	0.418
8	5 19 42.94	2.4491	19 15 12.5	0.295
9	5 22 9.81	2.4465	19 15 26.5	0.173
10	5 24 36.52	2.4439	19 15 33.2	+ 0.051
11	5 27 3.08	2.4413	19 15 32.6	− 0.072
12	5 29 29.48	2.4386	19 15 24.6	0.193
13	5 31 55.71	2.4358	19 15 9.4	0.313
14	5 34 21.77	2.4329	19 14 47.0	0.433
15	5 36 47.66	2.4301	19 14 17.4	0.553
16	5 39 13.38	2.4272	19 13 40.6	0.673
17	5 41 38.92	2.4241	19 12 56.7	0.792
18	5 44 4.27	2.4210	19 12 5.6	0.911
19	5 46 29.44	2.4179	19 11 7.4	1.028
20	5 48 54.42	2.4148	19 10 2.2	1.145
21	5 51 19.21	2.4116	19 8 50.0	1.262
22	5 53 43.81	2.4083	19 7 30.8	1.378
23	5 56 8.21	2.4051	19 6 4.6	1.494
24	5 58 32.42	2.4018	N.19 4 31.5	1.609

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 58 32.42	2.4018	N.19 4 31.5	1.609
1	6 0 56.43	2.3984	19 2 51.5	1.724
2	6 3 20.23	2.3949	19 1 4.6	1.838
3	6 5 43.82	2.3914	18 59 10.9	1.952
4	6 8 7.20	2.3879	18 57 10.4	2.064
5	6 10 30.37	2.3843	18 55 3.2	2.176
6	6 12 53.32	2.3807	18 52 49.3	2.287
7	6 15 16.05	2.3771	18 50 28.7	2.398
8	6 17 38.57	2.3735	18 48 1.5	2.508
9	6 20 0.87	2.3698	18 45 27.7	2.618
10	6 22 22.95	2.3661	18 42 47.4	2.727
11	6 24 44.80	2.3623	18 40 0.5	2.836
12	6 27 6.42	2.3584	18 37 7.1	2.943
13	6 29 27.81	2.3546	18 34 7.3	3.049
14	6 31 48.97	2.3507	18 31 1.2	3.155
15	6 34 9.90	2.3468	18 27 48.7	3.261
16	6 36 30.59	2.3428	18 24 29.9	3.365
17	6 38 51.04	2.3389	18 21 4.9	3.468
18	6 41 11.26	2.3350	18 17 33.7	3.572
19	6 43 31.24	2.3309	18 13 56.3	3.674
20	6 45 50.97	2.3268	18 10 12.8	3.776
21	6 48 10.46	2.3228	18 6 23.2	3.877
22	6 50 29.71	2.3188	18 2 27.6	3.976
23	6 52 48.71	2.3147	N.17 58 26.1	4.075

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 55 7.47	2.3105	N.17 54 18.6	4.174
1	6 57 25.97	2.3063	17 50 5.2	4.272
2	6 59 44.23	2.3022	17 45 46.0	4.368
3	7 2 2.24	2.2981	17 41 21.1	4.463
4	7 4 20.00	2.2939	17 36 50.4	4.559
5	7 6 37.51	2.2897	17 32 14.0	4.653
6	7 8 54.76	2.2854	17 27 32.0	4.746
7	7 11 11.76	2.2812	17 22 44.4	4.839
8	7 13 28.51	2.2770	17 17 51.3	4.932
9	7 15 45.00	2.2727	17 12 52.6	5.023
10	7 18 1.24	2.2685	17 7 48.5	5.113
11	7 20 17.22	2.2642	17 2 39.0	5.202
12	7 22 32.94	2.2599	16 57 24.2	5.291
13	7 24 48.41	2.2557	16 52 4.1	5.378
14	7 27 3.62	2.2514	16 46 38.8	5.465
15	7 29 18.57	2.2471	16 41 8.3	5.551
16	7 31 33.27	2.2428	16 35 32.7	5.637
17	7 33 47.71	2.2385	16 29 51.9	5.721
18	7 36 1.89	2.2342	16 24 6.1	5.804
19	7 38 15.82	2.2300	16 18 15.4	5.887
20	7 40 29.49	2.2257	16 12 19.7	5.969
21	7 42 42.90	2.2213	16 6 19.1	6.050
22	7 44 56.05	2.2171	16 0 13.7	6.130
23	7 47 8.95	2.2128	15 54 3.5	6.209
24	7 49 21.59	2.2086	N.15 47 48.6	6.287

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 25.					**THURSDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 49 21.59	2.2066	N.15 47 48.6	6.287	0	9 30 45.25	2.0254	N. 9 32 3.8	9.046
1	7 51 33.98	2.2043	15 41 29.0	6.365	1	9 32 46.68	2.0223	9 22 59.9	9.083
2	7 53 46.11	2.2000	15 35 4.8	6.442	2	9 34 47.93	2.0192	9 13 53.8	9.120
3	7 55 57.98	2.1958	15 28 36.0	6.517	3	9 36 48.99	2.0162	9 4 45.5	9.156
4	7 58 9.60	2.1916	15 22 2 7	6.592	4	9 38 49.87	2.0132	8 55 35.1	9.190
5	8 0 20.97	2.1873	15 15 25.0	6.666	5	9 40 50.57	2.0102	8 46 22.7	9.224
6	8 2 32.08	2.1830	15 8 42.8	6.740	6	9 42 51.10	2.0073	8 37 8.2	9.258
7	8 4 42.94	2.1789	15 1 56.2	6.812	7	9 44 51.45	2.0044	8 27 51.7	9.291
8	8 6 53.55	2.1747	14 55 5.4	6.883	8	9 46 51.63	2.0016	8 18 33.3	9.322
9	8 9 3.90	2.1705	14 48 10.3	6.953	9	9 48 51.64	1.9987	8 9 13.0	9.353
10	8 11 14.01	2.1664	14 41 11.0	7.023	10	9 50 51.48	1.9959	7 59 50.9	9.383
11	8 13 23.87	2.1622	14 34 7.5	7.091	11	9 52 51.15	1.9932	7 50 27.0	9.413
12	8 15 33.48	2.1581	14 27 0.0	7.159	12	9 54 50.66	1.9905	7 41 1.3	9.442
13	8 17 42.84	2.1540	14 19 48.4	7.227	13	9 56 50.01	1.9878	7 31 33.9	9.470
14	8 19 51.96	2.1499	14 12 32.8	7.293	14	9 58 49.20	1.9852	7 22 4.9	9.497
15	8 22 0.83	2.1458	14 5 13.2	7.359	15	10 0 48.23	1.9826	7 12 34.3	9.523
16	8 24 9.46	2.1417	13 57 49.7	7.423	16	10 2 47.11	1.9801	7 3 2.1	9.550
17	8 26 17.84	2.1377	13 50 22.4	7.487	17	10 4 45.84	1.9775	6 53 28.3	9.575
18	8 28 25.98	2.1337	13 42 51.3	7.549	18	10 6 44.41	1.9750	6 43 53.1	9.598
19	8 30 33.88	2.1297	13 35 16.5	7.611	19	10 8 42.84	1.9726	6 34 16.5	9.622
20	8 32 41.54	2.1257	13 27 38.0	7.672	20	10 10 41.12	1.9702	6 24 38.5	9.645
21	8 34 48.97	2.1218	13 19 55.8	7.733	21	10 12 39.26	1.9678	6 14 59.1	9.667
22	8 36 56.16	2.1178	13 12 10.0	7.792	22	10 14 37.26	1.9655	6 5 18.4	9.686
23	8 39 3.11	2.1139	N.13 4 20.7	7.851	23	10 16 35.12	1.9632	N. 5 55 36.5	9.709
	WEDNESDAY 26.					**FRIDAY 28.**			
0	8 41 9.83	2.1101	N.12 56 27.9	7.909	0	10 18 32.84	1.9609	N. 5 45 53.3	9.729
1	8 43 16.32	2.1062	12 48 31.6	7.966	1	10 20 30.43	1.9587	5 36 9.0	9.748
2	8 45 22.58	2.1023	12 40 32.0	8.021	2	10 22 27.89	1.9566	5 26 23.6	9.766
3	8 47 28.60	2.0985	12 32 29.1	8.076	3	10 24 25.22	1.9544	5 16 37.1	9.784
4	8 49 34.40	2.0947	12 24 22.9	8.131	4	10 26 22.42	1.9523	5 6 49.5	9.802
5	8 51 39.97	2.0910	12 16 13.4	8.185	5	10 28 19.50	1.9503	4 57 0.9	9.818
6	8 53 45.32	2.0873	12 8 0.7	8.237	6	10 30 16.46	1.9483	4 47 11.4	9.833
7	8 55 50.45	2.0836	11 59 44.9	8.289	7	10 32 13.30	1.9463	4 37 21.0	9.847
8	8 57 55.35	2.0799	11 51 26.0	8.340	8	10 34 10.02	1.9443	4 27 29.8	9.861
9	9 0 0.03	2.0762	11 43 4.1	8.390	9	10 36 6.62	1.9424	4 17 37.7	9.875
10	9 2 4.50	2.0727	11 34 39.2	8.440	10	10 38 3.11	1.9406	4 7 44.8	9.887
11	9 4 8.75	2.0691	11 26 11.3	8.489	11	10 39 59.50	1.9389	3 57 51.2	9.899
12	9 6 12.79	2.0656	11 17 40.5	8.537	12	10 41 55.78	1.9371	3 47 56.9	9.910
13	9 8 16.62	2.0621	11 9 6.9	8.583	13	10 43 51.95	1.9353	3 38 2.0	9.921
14	9 10 20.24	2.0586	11 0 30.5	8.629	14	10 45 48.02	1.9337	3 28 6.4	9.932
15	9 12 23.65	2.0551	10 51 51.4	8.674	15	10 47 43.99	1.9320	3 18 10.2	9.941
16	9 14 26.85	2.0516	10 43 9.6	8.719	16	10 49 39.86	1.9304	3 8 13.5	9.948
17	9 16 29.84	2.0482	10 34 25.1	8.763	17	10 51 35.64	1.9289	2 58 16.4	9.956
18	9 18 32.63	2.0448	10 25 38.0	8.806	18	10 53 31.33	1.9274	2 48 18.8	9.963
19	9 20 35.22	2.0415	10 16 48.4	8.848	19	10 55 26.93	1.9259	2 38 20.8	9.969
20	9 22 37.61	2.0383	10 7 56.3	8.889	20	10 57 22.44	1.9244	2 28 22.5	9.975
21	9 24 39.81	2.0351	9 59 1.7	8.930	21	10 59 17.86	1.9229	2 18 23.8	9.981
22	9 26 41.82	2.0318	9 50 4.7	8.969	22	11 1 13.19	1.9215	2 8 24.8	9.985
23	9 28 43.63	2.0286	9 41 5.4	9.008	23	11 3 8.44	1.9202	1 58 25.6	9.988
24	9 30 45.25	2.0254	N. 9 32 3.8	9.046	24	11 5 3.62	1.9190	N. 1 48 26.2	9.991

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 29.			
	h m s	s	° ′ ″	″
0	11 5 3.62	1.9190	N. 1 48 26.2	9.991
1	11 6 58.72	1.9178	1 38 26.7	9.993
2	11 8 53.75	1.9166	1 28 27.1	9.995
3	11 10 48.71	1.9154	1 18 27.3	9.997
4	11 12 43.60	1.9142	1 8 27.5	9.997
5	11 14 38.42	1.9131	0 58 27.7	9.996
6	11 16 33.17	1.9120	0 48 28.0	9.994
7	11 18 27.86	1.9111	0 38 28.4	9.993
8	11 20 22.50	1.9102	0 28 28.9	9.991
9	11 22 17.08	1.9092	0 18 29.5	9.988
10	11 24 11.61	1.9083	N. 0 8 30.3	9.984
11	11 26 6.08	1.9074	S. 0 1 28.6	9.979
12	11 28 0.50	1.9066	0 11 27.2	9.974
13	11 29 54.87	1.9058	0 21 25.5	9.968
14	11 31 49.20	1.9051	0 31 23.4	9.962
15	11 33 43.48	1.9043	0 41 21.0	9.956
16	11 35 37.72	1.9037	0 51 18.1	9.948
17	11 37 31.93	1.9032	1 1 14.7	9.939
18	11 39 26.10	1.9026	1 11 10.8	9.930
19	11 41 20.24	1.9020	1 21 6.3	9.920
20	11 43 14.34	1.9014	1 31 1.2	9.911
21	11 45 8.41	1.9009	1 40 55.6	9.901
22	11 47 2.45	1.9005	1 50 49.3	9.889
23	11 48 56.47	1.9002	S. 2 0 42.2	9.876
	SUNDAY 30.			
0	11 50 50.47	1.8998	S. 2 10 34.4	9.863
1	11 52 44.45	1.8995	2 20 25.8	9.850
2	11 54 38.41	1.8992	2 30 16.4	9.836
3	11 56 32.35	1.8989	2 40 6.1	9.821
4	11 58 26.28	1.8987	2 49 54.9	9.806
5	12 0 20.19	1.8986	2 59 42.8	9.790
6	12 2 14.10	1.8984	3 9 29.7	9.773
7	12 4 8.00	1.8983	3 19 15.6	9.756
8	12 6 1.89	1.8982	3 29 0.4	9.738
9	12 7 55.78	1.8982	3 38 44.1	9.719
10	12 9 49.67	1.8982	3 48 26.7	9.700
11	12 11 43.56	1.8982	3 58 8.1	9.681
12	12 13 37.45	1.8983	4 7 48.4	9.661
13	12 15 31.35	1.8984	4 17 27.4	9.639
14	12 17 25.26	1.8985	4 27 5.1	9.618
15	12 19 19.17	1.8987	4 36 41.5	9.596
16	12 21 13.10	1.8989	4 46 16.6	9.573
17	12 23 7.04	1.8991	4 55 50.3	9.549
18	12 25 0.99	1.8993	5 5 22.5	9.525
19	12 26 54.96	1.8997	5 14 53.3	9.501
20	12 28 48.95	1.9001	5 24 22.6	9.476
21	12 30 42.97	1.9005	5 33 50.4	9.450
22	12 32 37.01	1.9008	5 43 16.6	9.423
23	12 34 31.07	1.9012	5 52 41.2	9.397
24	12 36 25.16	1.9017	S. 6 2 4.2	9.369

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY, OCTOBER 1.			
	h m s	s	° ′ ″	″
0	12 36 25.16	1.9017	S. 6 2 4.2	9.369

PHASES OF THE MOON.

	d	h	m
● New Moon	1	2	14.3
☽ First Quarter . . .	9	6	37.8
○ Full Moon	16	9	41.2
☾ Last Quarter	23	0	50.7
● New Moon	30	17	54.3

	d	h
☾ Apogee	5	15.8
☾ Perigee	17	19.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
3	Sun	W.	21° 37′ 20″	3433	22° 58′ 59″	3431	24° 20′ 40″	3431	25° 42′ 21″	3432
	Antares	E.	65 56 19	3033	64 26 47	3040	62 57 24	3048	61 28 11	3056
	α Aquilæ	E.	115 37 53	3484	114 17 11	3479	112 56 24	3475	111 35 32	3471
4	Sun	W.	32 30 23	3442	33 51 52	3445	35 13 18	3447	36 34 41	3450
	Antares	E.	54 4 24	3093	52 36 6	3100	51 7 56	3107	49 39 55	3114
	α Aquilæ	E.	104 50 24	3462	103 29 18	3462	102 8 11	3462	100 47 4	3462
5	Sun	W.	43 20 53	3462	44 42 0	3463	46 3 5	3465	47 24 8	3466
	Antares	E.	42 22 4	3152	40 54 57	3159	39 27 59	3167	38 1 11	3177
	α Aquilæ	E.	94 1 38	3467	92 40 37	3468	91 19 37	3470	89 58 39	3471
6	Sun	W.	54 9 13	3467	55 30 14	3466	56 51 16	3464	58 12 20	3463
	Spica	W.	15 38 56	3087	17 7 21	3085	18 35 49	3083	20 4 19	3082
	Antares	E.	30 49 59	3930	29 24 25	3943	27 59 7	3959	26 34 8	3979
	α Aquilæ	E.	83 14 25	3483	81 53 42	3486	80 33 2	3489	79 12 26	3492
7	Sun	W.	64 58 14	3448	66 19 36	3445	67 41 2	3439	69 2 34	3434
	Spica	W.	27 27 31	3068	28 56 20	3064	30 25 14	3059	31 54 14	3054
	α Aquilæ	E.	72 30 16	3510	71 10 3	3514	69 49 54	3518	68 29 50	3524
	Fomalhaut	E.	102 25 41	3536	101 5 57	3527	99 46 3	3518	98 25 59	3510
8	Sun	W.	75 51 52	3401	77 14 7	3393	78 36 31	3385	79 59 5	3376
	Spica	W.	39 20 50	3024	40 50 33	3017	42 20 25	3009	43 50 26	3001
	α Aquilæ	E.	61 51 5	3556	60 31 43	3565	59 12 31	3575	57 53 30	3586
	Fomalhaut	E.	91 43 31	3472	90 22 36	3465	89 1 33	3458	87 40 22	3451
	α Pegasi	E.	108 28 4	3211	107 2 8	3201	105 36 0	3191	104 9 40	3180
9	Sun	W.	86 54 39	3324	88 18 23	3312	89 42 21	3300	91 6 33	3287
	Spica	W.	51 23 17	2954	52 54 28	2942	54 25 53	2931	55 57 33	2920
	α Aquilæ	E.	51 21 51	3663	50 4 25	3685	48 47 22	3709	47 30 45	3737
	Fomalhaut	E.	80 52 28	3417	79 30 31	3410	78 8 26	3405	76 46 15	3399
	α Pegasi	E.	96 54 44	3124	95 27 4	3113	93 59 10	3101	92 31 2	3089
10	Sun	W.	98 11 28	3216	99 37 18	3201	101 3 26	3186	102 29 52	3170
	Spica	W.	63 39 44	2855	65 13 1	2840	66 46 37	2826	68 20 31	2811
	Antares	W.	19 29 28	3187	20 55 53	3129	22 23 27	3079	23 52 2	3034
	α Aquilæ	E.	41 16 17	3942	40 3 40	4002	38 52 2	4070	37 41 31	4147
	Fomalhaut	E.	69 53 50	3377	68 31 7	3374	67 8 21	3372	65 45 33	3371
	α Pegasi	E.	85 6 33	3026	83 36 53	3013	82 6 56	3000	80 36 43	2986
11	Sun	W.	109 47 1	3085	111 15 29	3067	112 44 19	3048	114 13 32	3030
	Spica	W.	76 15 0	2732	77 50 57	2716	79 27 16	2698	81 3 58	2681
	Antares	W.	31 27 8	2865	33 0 12	2838	34 33 51	2811	36 8 4	2785
	Fomalhaut	E.	58 51 35	3382	57 28 58	3390	56 6 30	3399	54 44 12	3410
	α Pegasi	E.	73 1 26	2920	71 29 33	2907	69 57 23	2894	68 24 57	2881
12	Sun	W.	121 45 24	2935	123 16 58	2916	124 48 56	2897	126 21 19	2877
	Spica	W.	89 13 19	2593	90 52 24	2574	92 31 54	2556	94 11 49	2538
	Antares	W.	44 7 17	2668	45 44 40	2645	47 22 34	2623	49 0 58	2601
	Fomalhaut	E.	47 57 3	3515	46 36 56	3550	45 17 27	3589	43 58 41	3636
	α Pegasi	E.	60 38 48	2823	59 4 50	2813	57 30 39	2804	55 56 16	2796
	α Arietis	E.	103 36 11	2664	101 58 43	2646	100 20 50	2626	98 42 31	2607

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
3	Sun	W.	27° 4′ 1″	3433	28° 25′ 40″	3435	29° 47′ 17″	3438	31° 8′ 51″	3439
	Antares	E.	59 59 7	3063	58 30 12	3071	57 1 27	3078	55 32 51	3086
	α Aquilæ	E.	110 14 36	3468	108 53 36	3466	107 32 34	3464	106 11 30	3462
4	Sun	W.	37 56 1	3453	39 17 18	3455	40 38 32	3457	41 59 44	3460
	Antares	E.	48 12 3	3122	46 44 20	3129	45 16 46	3137	43 49 21	3143
	α Aquilæ	E.	99 25 57	3462	98 4 51	3462	96 43 45	3464	95 22 41	3465
5	Sun	W.	48 45 10	3467	50 6 11	3467	51 27 12	3468	52 48 12	3467
	Antares	E.	36 34 34	3185	35 8 7	3194	33 41 51	3205	32 15 48	3217
	α Aquilæ	E.	88 37 43	3474	87 16 50	3476	85 55 59	3479	84 35 11	3480
6	Sun	W.	59 33 25	3462	60 54 32	3459	62 15 42	3455	63 36 56	3452
	Spica	W.	21 32 51	3079	23 1 26	3077	24 30 4	3073	25 58 46	3071
	Antares	E.	25 9 32	3301	23 45 22	3327	22 21 42	3359	20 58 39	3398
	α Aquilæ	E.	77 51 53	3495	76 31 23	3498	75 10 57	3501	73 50 34	3506
7	Sun	W.	70 24 12	3429	71 45 56	3422	73 7 47	3415	74 29 46	3409
	Spica	W.	33 23 20	3049	34 52 32	3044	36 21 50	3038	37 51 16	3031
	α Aquilæ	E.	67 9 52	3529	65 50 0	3534	64 30 14	3542	63 10 36	3548
	Fomalhaut	E.	97 5 46	3503	95 45 25	3495	94 24 55	3488	93 4 17	3480
8	Sun	W.	81 21 49	3366	82 44 44	3357	84 7 50	3346	85 31 8	3335
	Spica	W.	45 20 37	2993	46 50 59	2983	48 21 33	2973	49 52 19	2964
	α Aquilæ	E.	56 34 40	3598	55 16 4	3612	53 57 43	3627	52 39 38	3644
	Fomalhaut	E.	86 19 3	3444	84 57 36	3437	83 36 1	3430	82 14 18	3423
	α Pegasi	E.	102 43 7	3169	101 16 21	3158	99 49 22	3148	98 22 10	3136
9	Sun	W.	92 31 0	3274	93 55 42	3259	95 20 41	3246	96 45 56	3231
	Spica	W.	57 29 27	2907	59 1 37	2895	60 34 2	2882	62 6 44	2868
	α Aquilæ	E.	46 14 37	3768	44 59 2	3804	43 44 4	3844	42 29 47	3890
	Fomalhaut	E.	75 23 57	3393	74 1 33	3389	72 39 4	3384	71 16 29	3380
	α Pegasi	E.	91 2 39	3077	89 34 1	3064	88 5 7	3051	86 35 58	3038
10	Sun	W.	103 56 37	3153	105 23 42	3136	106 51 8	3119	108 18 54	3102
	Spica	W.	69 54 44	2796	71 29 17	2781	73 4 10	2765	74 39 24	2748
	Antares	W.	25 21 32	2995	26 51 51	2959	28 22 55	2925	29 54 42	2894
	α Aquilæ	E.	36 32 15	4236	35 24 23	4340	34 18 7	4459	33 13 39	4599
	Fomalhaut	E.	64 22 43	3371	62 59 53	3371	61 37 4	3373	60 14 17	3378
	α Pegasi	E.	79 6 13	2973	77 35 26	2960	76 4 23	2946	74 33 3	2933
11	Sun	W.	115 43 8	3011	117 13 7	2993	118 43 29	2973	120 14 15	2955
	Spica	W.	82 41 3	2664	84 18 31	2646	85 56 23	2629	87 34 39	2611
	Antares	W.	37 42 51	2761	39 18 10	2737	40 54 1	2713	42 30 24	2690
	Fomalhaut	E.	53 22 7	3424	52 0 18	3441	50 38 48	3462	49 17 42	3487
	α Pegasi	E.	66 52 14	2869	65 19 15	2857	63 46 1	2845	62 12 32	2834
12	Sun	W.	127 54 7	2858	129 27 20	2839	131 0 57	2820	132 34 59	2801
	Spica	W.	95 52 9	2520	97 32 55	2502	99 14 6	2483	100 55 43	2465
	Antares	W.	50 39 51	2580	52 19 13	2559	53 59 4	2538	55 39 24	2518
	Fomalhaut	E.	42 40 46	3691	41 23 49	3754	40 7 59	3828	38 53 26	3914
	α Pegasi	E.	54 21 43	2788	52 47 0	2782	51 12 9	2777	49 37 12	2775
	α Arietis	E.	97 3 46	2588	95 24 35	2570	93 44 59	2551	92 4 57	2533

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
13	Antares	W.	57° 20′ 12″	2496	59° 1′ 28″	2477	60° 43′ 13″	2457	62° 25′ 26″	2438
	α Pegasi	E.	48 2 12	2774	46 27 10	2775	44 52 9	2778	43 17 13	2785
	α Arietis	E.	90 24 30	2514	88 43 37	2497	87 2 19	2479	85 20 36	2461
	Aldebaran	E.	123 42 54	2452	122 0 33	2433	120 17 46	2415	118 34 33	2396
14	Antares	W.	71 3 15	2346	72 48 7	2328	74 33 25	2312	76 19 7	2295
	α Arietis	E.	76 45 56	2378	75 1 50	2363	73 17 22	2348	71 32 32	2334
	Aldebaran	E.	109 52 0	2309	108 6 14	2293	106 20 4	2276	104 33 29	2260
	Saturn	E.	111 31 25	2310	109 45 40	2293	107 59 31	2277	106 12 58	2261
15	Antares	W.	85 13 29	2220	87 1 26	2206	88 49 44	2194	90 38 21	2182
	α Aquilæ	W.	39 45 48	3281	41 10 21	3191	42 36 41	3109	44 4 39	3035
	α Arietis	E.	62 43 29	2272	60 56 48	2262	59 9 52	2253	57 22 43	2245
	Aldebaran	E.	95 34 53	2186	93 46 5	2173	91 56 57	2161	90 7 30	2148
	Saturn	E.	97 14 28	2187	95 25 41	2174	93 36 34	2161	91 47 8	2149
16	Antares	W.	99 45 43	2130	101 35 56	2122	103 26 21	2114	105 16 58	2106
	α Aquilæ	W.	51 44 45	2761	53 20 4	2720	54 56 17	2684	56 33 18	2651
	α Arietis	E.	48 24 26	2220	46 36 29	2220	44 48 31	2221	43 0 35	2225
	Aldebaran	E.	80 55 51	2096	79 4 45	2087	77 13 26	2079	75 21 54	2071
	Saturn	E.	82 35 31	2096	80 44 25	2086	78 53 5	2079	77 1 33	2071
	Mars	E.	116 38 5	2293	114 51 55	2283	113 5 31	2274	111 18 53	2266
17	α Aquilæ	W.	64 48 16	2529	66 28 49	2512	68 9 46	2497	69 51 4	2484
	Fomalhaut	W.	38 0 43	3455	39 21 57	3341	40 45 21	3241	42 10 41	3155
	Aldebaran	E.	66 1 47	2045	64 9 23	2042	62 16 55	2040	60 24 23	2039
	Saturn	E.	67 41 22	2044	65 48 57	2041	63 56 27	2039	62 3 53	2037
	Mars	E.	102 23 4	2236	100 35 30	2233	98 47 51	2229	97 0 7	2226
	Pollux	E.	108 34 41	2143	106 44 47	2137	104 54 45	2133	103 4 36	2130
	Jupiter	E.	115 52 41	2113	114 2 1	2109	112 11 15	2106	110 20 25	2104
18	α Aquilæ	W.	78 21 11	2447	80 3 39	2445	81 46 10	2443	83 28 43	2444
	Fomalhaut	W.	49 39 50	2855	51 13 7	2815	52 47 15	2780	54 22 9	2750
	α Pegasi	W.	30 55 43	2729	32 31 44	2663	34 9 14	2608	35 47 58	2562
	Aldebaran	E.	51 1 30	2041	49 9 0	2044	47 16 34	2047	45 24 13	2051
	Saturn	E.	52 40 42	2038	50 48 7	2041	48 55 36	2044	47 3 10	2047
	Mars	E.	88 1 8	2229	86 13 23	2231	84 25 42	2235	82 38 6	2239
	Pollux	E.	93 53 4	2127	92 2 46	2129	90 12 31	2132	88 22 21	2136
	Jupiter	E.	101 5 43	2103	99 14 48	2105	97 23 56	2108	95 33 9	2111
19	Fomalhaut	W.	62 25 3	2652	64 2 48	2641	65 40 47	2632	67 18 58	2626
	α Pegasi	W.	44 14 24	2426	45 57 22	2411	47 40 41	2400	49 24 16	2391
	Aldebaran	E.	36 4 29	2083	34 13 3	2091	32 21 50	2101	30 30 52	2111
	Saturn	E.	37 42 43	2075	35 51 6	2083	33 59 40	2090	32 8 26	2100
	Mars	E.	73 41 54	2269	71 55 9	2276	70 8 35	2285	68 22 14	2294
	Pollux	E.	79 13 23	2167	77 24 6	2176	75 35 2	2186	73 46 13	2196
	Jupiter	E.	86 20 54	2139	84 30 54	2146	82 41 5	2154	80 51 28	2163
	Regulus	E.	115 45 0	2092	113 53 49	2099	112 2 48	2106	110 11 58	2114
20	Fomalhaut	W.	75 31 9	2623	77 9 33	2626	78 47 52	2632	80 26 3	2638
	α Pegasi	W.	58 4 15	2379	59 48 20	2381	61 32 22	2384	63 16 19	2389
	Mars	E.	59 34 7	2349	57 49 19	2362	56 4 50	2375	54 20 39	2389
	Pollux	E.	64 46 19	2258	62 59 18	2273	61 12 39	2288	59 26 22	2305

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13	Antares	W.	64° 8′ 6″	2419	65° 51′ 13″	2400	67° 34′ 47″	2382	69° 18′ 48″	2364
	α Pegasi	E.	41 42 25	2795	40 7 50	2809	38 33 34	2828	36 59 42	2852
	α Arietis	E.	83 38 28	2444	81 55 56	2426	80 12 59	2410	78 29 39	2394
	Aldebaran	E.	116 50 53	2379	115 6 48	2361	113 22 17	2344	111 37 21	2326
14	Antares	W.	78 5 14	2278	79 51 45	2264	81 38 38	2249	83 25 53	2235
	α Arietis	E.	69 47 22	2320	68 1 52	2306	66 16 2	2294	64 29 54	2283
	Aldebaran	E.	102 46 31	2245	100 59 10	2229	99 11 26	2214	97 23 20	2200
	Saturn	E.	104 26 1	2245	102 38 41	2231	100 50 59	2215	99 2 54	2201
15	Antares	W.	92 27 16	2170	94 16 29	2159	96 5 58	2149	97 55 43	2139
	α Aquilæ	W.	45 34 8	2969	47 5 0	2909	48 37 7	2855	50 10 24	2805
	α Arietis	E.	55 35 22	2237	53 47 50	2231	52 0 9	2226	50 12 20	2222
	Aldebaran	E.	88 17 44	2137	86 27 41	2125	84 37 20	2114	82 46 43	2105
	Saturn	E.	89 57 23	2137	88 7 20	2126	86 17 0	2114	84 26 23	2105
16	Antares	W.	107 7 45	2102	108 58 41	2097	110 49 44	2093	112 40 54	2089
	α Aquilæ	W.	58 11 4	2621	59 49 30	2594	61 28 33	2570	63 8 9	2548
	α Arietis	E.	41 12 44	2231	39 25 2	2238	37 37 31	2249	35 50 16	2264
	Aldebaran	E.	73 30 11	2064	71 38 17	2059	69 46 14	2054	67 54 4	2050
	Saturn	E.	75 9 50	2064	73 17 56	2059	71 25 53	2053	69 33 41	2048
	Mars	E.	109 32 3	2258	107 45 2	2251	105 57 51	2245	104 10 31	2241
17	α Aquilæ	W.	71 32 40	2473	73 14 31	2464	74 56 35	2457	76 38 49	2451
	Fomalhaut	W.	43 37 44	3078	45 6 20	3011	46 36 19	2952	48 7 32	2901
	Aldebaran	E.	58 31 49	2038	56 39 14	2037	54 46 38	2038	52 54 3	2039
	Saturn	E.	60 11 16	2035	58 18 37	2135	56 25 58	2035	54 33 19	2037
	Mars	E.	95 12 21	2226	93 24 33	2226	91 36 44	2226	89 48 55	2227
	Pollux	E.	101 14 22	2128	99 24 5	2126	97 33 45	2125	95 43 24	2126
	Jupiter	E.	108 29 32	2102	106 38 36	2101	104 47 38	2101	102 56 40	2101
18	α Aquilæ	W.	85 11 15	2446	86 53 44	2450	88 36 8	2455	90 18 25	2460
	Fomalhaut	W.	55 57 43	2723	57 33 52	2701	59 10 31	2681	60 47 36	2665
	α Pegasi	W.	37 27 45	2524	39 8 25	2492	40 49 50	2465	42 31 52	2444
	Aldebaran	E.	43 31 59	2057	41 39 53	2062	39 47 55	2068	37 56 7	2075
	Saturn	E.	45 10 49	2051	43 18 35	2057	41 26 29	2062	39 34 31	2068
	Mars	E.	80 50 36	2243	79 3 13	2248	77 15 57	2254	75 28 50	2262
	Pollux	E.	86 32 17	2141	84 42 20	2146	82 52 31	2153	81 2 52	2159
	Jupiter	E.	93 42 27	2116	91 51 52	2120	90 1 24	2126	88 11 4	2132
19	Fomalhaut	W.	68 57 18	2621	70 35 44	2619	72 14 13	2619	73 52 42	2621
	α Pegasi	W.	51 8 3	2385	52 51 59	2380	54 36 2	2378	56 20 8	2377
	Aldebaran	E.	28 40 9	2121	26 49 42	2133	24 59 33	2146	23 9 44	2160
	Saturn	E.	30 17 26	2109	28 26 40	2118	26 36 9	2128	24 45 53	2139
	Mars	E.	66 36 6	2304	64 50 13	2315	63 4 35	2326	61 19 13	2337
	Pollux	E.	71 57 39	2207	70 9 22	2218	68 21 22	2231	66 33 41	2244
	Jupiter	E.	79 2 4	2172	77 12 54	2181	75 23 58	2192	73 35 18	2202
	Regulus	E.	108 21 20	2122	106 30 55	2131	104 40 43	2141	102 50 46	2151
20	Fomalhaut	W.	82 4 6	2646	83 41 58	2656	85 19 37	2666	86 57 2	2677
	α Pegasi	W.	65 0 9	2395	66 43 51	2402	68 27 23	2410	70 10 44	2418
	Mars	E.	52 36 48	2403	50 53 17	2417	49 10 7	2432	47 27 18	2448
	Pollux	E.	57 40 30	2322	55 55 3	2341	54 10 3	2359	52 25 30	2380

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			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
20	Jupiter	E.	71 46 54	2213	69 58 46	2225	68 10 56	2237	66 23 23	2249
	Regulus	E.	101 1 4	2161	99 11 38	2172	97 22 28	2183	95 33 35	2194
	Sun	E.	129 57 5	2453	128 14 46	2465	126 32 43	2477	124 50 57	2488
21	Fomalhaut	W.	88 34 12	2690	90 11 5	2703	91 47 41	2717	93 23 58	2733
	α Pegasi	W.	71 53 53	2427	73 36 49	2437	75 19 31	2448	77 1 58	2458
	α Arietis	W.	28 24 56	2545	30 5 6	2528	31 45 40	2516	33 26 31	2507
	Mars	E.	45 44 51	2464	44 2 47	2480	42 21 6	2498	40 39 50	2515
	Pollux	E.	50 41 26	2401	48 57 53	2423	47 14 51	2446	45 32 22	2472
	Jupiter	E.	57 30 26	2317	55 44 51	2332	53 59 38	2346	52 14 46	2362
	Regulus	E.	86 33 39	2257	84 46 37	2270	82 59 54	2284	81 13 31	2298
	Sun	E.	116 26 27	2553	114 46 28	2568	113 6 49	2582	111 27 30	2596
22	α Pegasi	W.	85 30 8	2520	87 10 53	2535	88 51 18	2548	90 31 24	2563
	α Arietis	W.	41 52 28	2504	43 33 36	2508	45 14 38	2514	46 55 32	2520
	Mars	E.	32 19 58	2616	30 41 25	2639	29 3 23	2663	27 25 54	2690
	Pollux	E.	37 9 33	2625	35 31 12	2664	33 53 44	2706	32 17 12	2753
	Jupiter	E.	43 36 4	2442	41 53 30	2460	40 11 20	2477	38 29 35	2495
	Regulus	E.	72 26 46	2370	70 42 28	2384	68 58 30	2398	67 14 53	2413
	Sun	E.	103 15 51	2671	101 38 32	2686	100 1 33	2701	98 24 54	2716
23	α Pegasi	W.	98 46 51	2638	100 24 54	2654	102 2 36	2670	103 39 56	2686
	α Arietis	W.	55 17 22	2564	56 57 6	2574	58 36 37	2585	60 15 53	2595
	Aldebaran	W.	21 25 58	2490	23 7 25	2501	24 48 37	2512	26 29 34	2523
	Saturn	W.	19 38 17	2470	21 20 12	2483	23 1 49	2496	24 43 8	2509
	Jupiter	E.	30 7 26	2596	28 28 26	2621	26 49 59	2646	25 12 6	2673
	Regulus	E.	58 42 4	2488	57 0 34	2502	55 19 24	2517	53 38 35	2533
	Sun	E.	90 26 43	2791	88 52 4	2807	87 17 45	2821	85 43 45	2837
24	α Arietis	W.	68 28 30	2651	70 6 16	2662	71 43 47	2673	73 21 3	2684
	Aldebaran	W.	34 50 16	2582	36 29 35	2595	38 8 37	2607	39 47 23	2619
	Saturn	W.	33 5 13	2573	34 44 45	2585	36 24 0	2599	38 2 57	2610
	Regulus	E.	45 19 41	2607	43 40 56	2622	42 2 31	2638	40 24 27	2654
	Sun	E.	77 58 30	2909	76 26 22	2923	74 54 32	2936	73 22 59	2950
25	α Arietis	W.	81 23 37	2741	82 59 23	2751	84 34 55	2763	86 10 12	2773
	Aldebaran	W.	47 57 11	2677	49 34 22	2688	51 11 18	2698	52 48 0	2710
	Saturn	W.	46 13 37	2669	47 50 58	2681	49 28 3	2692	51 4 53	2703
	Regulus	E.	32 19 30	2735	30 43 37	2753	29 8 8	2772	27 33 3	2792
	Sun	E.	65 49 27	3016	64 19 34	3028	62 49 56	3040	61 20 33	3052
26	α Arietis	W.	94 3 7	2826	95 37 1	2837	97 10 41	2847	98 44 8	2857
	Aldebaran	W.	60 47 56	2761	62 23 15	2771	63 58 21	2781	65 33 14	2791
	Saturn	W.	59 5 31	2755	60 40 58	2765	62 16 12	2775	63 51 13	2784
	Sun	E.	53 57 17	3109	52 29 19	3124	51 1 35	3139	49 34 4	3143
27	Aldebaran	W.	73 24 38	2835	74 58 20	2843	76 31 52	2852	78 5 13	2859
	Saturn	W.	71 43 18	2829	73 17 8	2837	74 50 48	2845	76 24 17	2853
	Sun	E.	42 19 37	3193	40 53 19	3203	39 27 13	3212	38 1 18	3221
28	Aldebaran	W.	85 49 26	2898	87 21 47	2905	88 53 59	2912	90 26 2	2919
	Saturn	W.	84 9 12	2891	85 41 42	2898	87 14 3	2905	88 46 15	2912
	Sun	E.	30 54 28	3267	29 29 38	3276	28 4 59	3285	26 40 30	3294

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20	JUPITER	E.	64° 36′ 9″	2262	62° 49′ 14″	2275	61° 2′ 38″	2289	59° 16′ 22″	2302
	Regulus	E.	93 44 59	2206	91 56 41	2219	90 8 42	2231	88 21 1	2244
	SUN	E.	123 9 27	2501	121 28 15	2513	119 47 20	2527	118 6 44	2540
21	Fomalhaut	W.	94 59 54	2749	96 35 29	2766	98 10 41	2785	99 45 29	2803
	α Pegasi	W.	78 44 10	2470	80 26 5	2482	82 7 44	2494	83 49 5	2507
	α Arietis	W.	35 7 34	2502	36 48 45	2499	38 30 0	2499	40 11 15	2500
	MARS	E.	38 58 58	2534	37 18 32	2553	35 38 33	2573	33 59 1	2594
	Pollux	E.	43 50 29	2498	42 9 13	2527	40 28 37	2557	38 48 43	2569
	JUPITER	E.	50 30 16	2377	48 46 9	2393	47 2 24	2409	45 19 2	2426
	Regulus	E.	79 27 29	2312	77 41 47	2326	75 56 26	2341	74 11 26	2355
	SUN	E.	109 48 30	2611	108 9 50	2626	106 31 30	2641	104 53 30	2656
22	α Pegasi	W.	92 11 10	2577	93 50 36	2592	95 29 42	2607	97 8 27	2623
	α Arietis	W.	48 36 17	2528	50 16 51	2536	51 57 14	2545	53 37 24	2554
	MARS	E.	25 49 1	2719	24 12 47	2751	22 37 15	2788	21 2 31	2830
	Pollux	E.	30 41 43	2806	29 7 23	2866	27 34 21	2935	26 2 46	3014
	JUPITER	E.	36 48 15	2514	35 7 22	2533	33 26 55	2553	31 46 56	2574
	Regulus	E.	65 31 37	2428	63 48 42	2442	62 6 8	2457	60 23 55	2473
	SUN	E.	96 48 36	2731	95 12 38	2747	93 37 0	2762	92 1 42	2776
23	α Pegasi	W.	105 16 54	2703	106 53 30	2720	108 29 43	2737	110 5 34	2755
	α Arietis	W.	61 54 54	2607	63 33 40	2617	65 12 12	2628	66 50 29	2640
	Aldebaran	W.	28 10 15	2535	29 50 40	2546	31 30 49	2558	33 10 41	2571
	SATURN	W.	26 24 9	2522	28 4 52	2535	29 45 17	2548	31 25 24	2561
	JUPITER	E.	23 34 50	2704	21 58 15	2738	20 22 25	2778	18 47 28	2824
	Regulus	E.	51 58 7	2548	50 18 0	2562	48 38 13	2577	46 58 47	2592
	SUN	E.	84 10 5	2852	82 36 44	2866	81 3 41	2880	79 30 56	2894
24	α Arietis	W.	74 58 4	2695	76 34 50	2707	78 11 20	2718	79 47 36	2729
	Aldebaran	W.	41 25 52	2631	43 4 5	2642	44 42 3	2654	46 19 45	2666
	SATURN	W.	39 41 38	2623	41 20 2	2635	42 58 10	2647	44 36 1	2658
	Regulus	E.	38 46 45	2669	37 9 24	2685	35 32 24	2701	33 55 46	2718
	SUN	E.	71 51 43	2963	70 20 44	2977	68 50 2	2989	67 19 36	3003
25	α Arietis	W.	87 45 15	2784	89 20 4	2795	90 54 39	2805	92 29 0	2816
	Aldebaran	W.	54 24 27	2720	56 0 40	2731	57 36 39	2741	59 12 24	2751
	SATURN	W.	52 41 29	2713	54 17 51	2725	55 53 58	2735	57 29 51	2745
	Regulus	E.	25 58 25	2814	24 24 15	2838	22 50 36	2865	21 17 32	2896
	SUN	E.	59 51 25	3064	58 22 32	3076	56 53 53	3087	55 25 28	3099
26	α Arietis	W.	100 17 22	2867	101 50 23	2877	103 23 11	2887	104 55 46	2898
	Aldebaran	W.	67 7 54	2800	68 42 22	2808	70 16 39	2818	71 50 44	2826
	SATURN	W.	65 26 2	2793	67 0 39	2802	68 35 4	2811	70 9 17	2821
	SUN	E.	48 6 46	3152	46 39 40	3163	45 12 47	3173	43 46 6	3183
27	Aldebaran	W.	79 38 24	2867	81 11 25	2876	82 44 15	2883	84 16 55	2890
	SATURN	W.	77 57 36	2861	79 30 45	2869	81 3 44	2876	82 36 33	2884
	SUN	E.	36 35 34	3231	35 10 2	3240	33 44 40	3249	32 19 29	3258
28	Aldebaran	W.	91 57 57	2926	93 29 43	2933	95 1 20	2939	96 32 49	2945
	SATURN	W.	90 18 19	2919	91 50 14	2926	93 22 0	2932	94 53 38	2938
	SUN	E.	25 16 11	3303	23 52 3	3312	22 28 6	3323	21 4 21	3332

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	12 29 12.47	9.058	S. 3 9 22.3	-58.28	16 1.38	64.35	10 16.18	0.797
Tues.	2	12 32 50.02	9.071	3 32 40.0	58.19	16 1.65	64.39	10 35.12	0.784
Wed.	3	12 36 27.88	9.084	3 55 55.3	58.09	16 1.93	64.44	10 53.76	0.771
Thur.	4	12 40 6.06	9.098	4 19 7.9	-57.96	16 2.22	64.49	11 12.09	0.757
Frid.	5	12 43 44.58	9.113	4 42 17.3	57.82	16 2.50	64.55	11 30.07	0.742
Sat.	6	12 47 23.45	9.129	5 5 23.2	57.66	16 2.78	64.61	11 47.70	0.726
SUN.	7	12 51 2.70	9.144	5 28 25.1	-57.49	16 3.06	64.67	12 4.95	0.711
Mon.	8	12 54 42.34	9.161	5 51 23.0	57.30	16 3.35	64.73	12 21.82	0.694
Tues.	9	12 58 22.40	9.178	6 14 16.1	57.10	16 3.63	64.79	12 38.28	0.677
Wed.	10	13 2 2.88	9.196	6 37 4.2	-56.89	16 3.91	64.86	12 54.30	0.659
Thur.	11	13 5 43.81	9.215	6 59 47.0	56.66	16 4.19	64.93	13 9.88	0.640
Frid.	12	13 9 25.20	9.235	7 22 24.0	56.42	16 4.47	65.00	13 24.99	0.620
Sat.	13	13 13 7.08	9.255	7 44 54.9	-56.15	16 4.75	65.07	13 39.62	0.600
SUN.	14	13 16 49.48	9.277	8 7 19.5	55.87	16 5.03	65.15	13 53.74	0.578
Mon.	15	13 20 32.43	9.300	8 29 37.2	55.58	16 5.30	65.23	14 7.31	0.555
Tues.	16	13 24 15.92	9.324	8 51 47.7	-55.27	16 5.57	65.31	14 20.33	0.531
Wed.	17	13 27 59.98	9.348	9 13 50.6	54.94	16 5.84	65.40	14 32.79	0.507
Thur.	18	13 31 44.64	9.374	9 35 45.6	54.61	16 6.11	65.49	14 44.65	0.481
Frid.	19	13 35 29.93	9.400	9 57 32.2	-54.26	16 6.38	65.58	14 55.89	0.455
Sat.	20	13 39 15.86	9.427	10 19 10.2	53.89	16 6.65	65.67	15 6.48	0.428
SUN.	21	13 43 2.45	9.455	10 40 39.1	53.51	16 6.91	65.77	15 16.42	0.400
Mon.	22	13 46 49.71	9.484	11 1 58.6	-53.11	16 7.17	65.87	15 25.70	0.371
Tues.	23	13 50 37.67	9.514	11 23 8.3	52.69	16 7.43	65.97	15 34.27	0.342
Wed.	24	13 54 26.34	9.544	11 44 7.7	52.26	16 7.69	66.07	15 42.13	0.312
Thur.	25	13 58 15.73	9.574	12 4 56.5	-51.80	16 7.95	66.17	15 49.27	0.282
Frid.	26	14 2 5.85	9.605	12 25 34.3	51.33	16 8.21	66.27	15 55.67	0.251
Sat.	27	14 5 56.73	9.635	12 46 0.7	50.85	16 8.46	66.38	16 1.33	0.221
SUN.	28	14 9 48.37	9.667	13 6 15.2	-50.34	16 8.72	66.49	16 6.23	0.189
Mon.	29	14 13 40.78	9.700	13 26 17.5	49.83	16 8.98	66.60	16 10.36	0.156
Tues.	30	14 17 33.97	9.733	13 46 7.1	49.29	16 9.24	66.71	16 13.72	0.123
Wed.	31	14 21 27.93	9.765	14 5 43.5	48.73	16 9.49	66.82	16 16.30	0.091
Thur.	32	14 25 22.69	9.798	S. 14 25 6.3	-48.16	16 9.74	66.93	16 18.09	0.058

NOTE.—The mean time of semidiameter passing may be found by subtracting 0ˢ.18 from the sidereal time.
The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	12 29 14.02	9.060	S. 3 9 32.1	-58.30	10 16.31	0.797	12 39 30.33
Tues.	2	12 32 51.62	9.073	3 32 50.2	58.20	10 35.26	0.784	12 43 26.88
Wed.	3	12 36 29.53	9.086	3 56 5.8	58.10	10 53.90	0.771	12 47 23.43
Thur.	4	12 40 7.76	9.100	4 19 18.7	-57.97	11 12.23	0.757	12 51 19.99
Frid.	5	12 43 46.33	9.115	4 42 28 4	57.83	11 30.21	0.742	12 55 16.54
Sat.	6	12 47 25.25	9.131	5 5 34.6	57.68	11 47.84	0.726	12 59 13.09
SUN.	7	12 51 4.55	9.146	5 28 36.8	-57.50	12 5.09	0.711	13 3 9.64
Mon.	8	12 54 44.23	9.163	5 51 34.9	57.31	12 21.96	0.694	13 7 6.19
Tues.	9	12 58 24.33	9.180	6 14 28.2	57.12	12 38.42	0.677	13 11 2.75
Wed.	10	13 2 4.86	9.198	6 37 16.5	-56.90	12 54.44	0 659	13 14 59.30
Thur.	11	13 5 45.83	9.217	6 59 59.5	56.67	13 10.02	0.640	13 18 55.85
Frid.	12	13 9 27.27	9.237	7 22 36.7	56.43	13 25.13	0.620	13 22 52.40
Sat.	13	13 13 9.19	9.257	7 45 7.7	-56.16	13 39.76	0.600	13 26 48.95
SUN.	14	13 16 51.63	9.279	8 7 32.4	55.88	13 53.88	0.578	13 30 45.51
Mon.	15	13 20 34.62	9.302	8 29 50.2	55.59	14 7.44	0.555	13 34 42.06
Tues.	16	13 24 18.15	9.326	8 52 0.8	-55.28	14 20.46	0.531	13 38 38.61
Wed.	17	13 28 2.25	9.350	9 14 3.8	54.95	14 32.91	0.507	13 42 35.16
Thur.	18	13 31 46.95	9.376	9 35 58.9	54.61	14 44 76	0.481	13 46 31.71
Frid.	19	13 35 32.27	9.402	9 57 45.6	-54.27	14 56.00	0.455	13 50 28.27
Sat.	20	13 39 18.23	9.429	10 19 23.7	53.89	15 6.59	0.428	13 54 24.82
SUN.	21	13 43 4.85	9.457	10 40 52.7	53.51	15 16.52	0.400	13 58 21.37
Mon.	22	13 46 52.14	9.486	11 2 12.3	-53.11	15 25.79	0.371	14 2 17.93
Tues.	23	13 50 40.13	9.515	11 23 22.0	52.69	15 34.35	0.342	14 6 14.48
Wed.	24	13 54 28.83	9.545	11 44 21.4	52.26	15 42.21	0.312	14 10 11.04
Thur.	25	13 58 18.25	9.575	12 5 10.2	-51.80	15 49.34	0.282	14 14 7.59
Frid.	26	14 2 8.41	9.606	12 25 48.0	51.33	15 55.73	0.251	14 18 4.14
Sat.	27	14 5 59.31	9.636	12 46 14.3	50.85	16 1.38	0.221	14 22 0.69
SUN.	28	14 9 50.97	9.668	13 6 28.7	-50.34	16 6.28	0.189	14 25 57.25
Mon.	29	14 13 43.40	9.701	13 26 30.9	49.83	16 10.40	0.156	14 29 53.80
Tues.	30	14 17 36.61	9.734	13 46 20.4	49.29	16 13.75	0.123	14 33 50.36
Wed.	31	14 21 30.59	9.766	14 5 56.7	48.73	16 16.32	0.091	14 37 46.91
Thur.	32	14 25 25.36	9.799	S. 14 25 19.4	-48.16	16 18.10	0.058	14 41 43.46

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,
+ $9^s.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	274	187 57 51.0	57 3.8	147.69	− 0.54	0.0002820	− 52.0	11 18 38.18
2	275	188 56 56.7	56 9.4	147.78	0.41	0.0001568	52.3	11 14 42.29
3	276	189 56 4.3	55 17.0	147.86	0.28	0.0000308	52.6	11 10 46.38
4	277	190 55 13.9	54 26.5	147.94	− 0.15	9.9999042	− 52.8	11 6 50.47
5	278	191 54 25.4	53 37.9	148.02	− 0.03	9.9997771	53.0	11 2 54.56
6	279	192 53 38.8	52 51.2	148.10	+ 0.09	9.9996497	53.1	10 58 58.66
7	280	193 52 54.0	52 6.4	148.17	+ 0.19	9.9995220	− 53.2	10 55 2.75
8	281	194 52 11.1	51 23.4	148.25	0.25	9.9993942	53.2	10 51 6.84
9	282	195 51 29.9	50 42.2	148.32	0.27	9.9992665	53.2	10 47 10.93
10	283	196 50 50.4	50 2.6	148.39	+ 0.27	9.9991390	− 53.1	10 43 15.03
11	284	197 50 12.5	49 24.6	148.46	0.24	9.9990119	52.9	10 39 19.12
12	285	198 49 36.5	48 48.5	148.54	0.19	9.9988853	52.6	10 35 23.21
13	286	199 49 2.4	48 14.3	148.62	+ 0.12	9.9987593	− 52.3	10 31 27.31
14	287	200 48 30.2	47 42.0	148.70	+ 0.01	9.9986341	52.0	10 27 31.41
15	288	201 47 59.8	47 11.5	148.78	− 0.12	9.9985098	51.6	10 23 35.50
16	289	202 47 31.4	46 43.0	148.86	− 0.26	9.9983865	− 51.2	10 19 39.59
17	290	203 47 5.1	46 16.6	148.94	0.39	9.9982642	50.8	10 15 43.68
18	291	204 46 40.9	45 52.3	149.02	0.53	9.9981429	50.4	10 11 47.78
19	292	205 46 18.8	45 30.1	149.12	− 0.64	9.9980226	− 49.9	10 7 51.87
20	293	206 45 58.8	45 10.0	149.21	0.74	9.9979034	49.5	10 3 55.96
21	294	207 45 41.1	44 52.2	149.31	0.81	9.9977851	49.1	10 0 0.05
22	295	208 45 25.6	44 36.6	149.40	− 0.86	9.9976678	− 48.8	9 56 4.15
23	296	209 45 12.4	44 23.3	149.50	0.87	9.9975511	48.5	9 52 8.24
24	297	210 45 1.4	44 12.2	149.59	0.86	9.9974351	48.2	9 48 12.33
25	298	211 44 52.7	44 3.4	149.69	− 0.83	9.9973197	− 48.0	9 44 16.43
26	299	212 44 46.2	43 56.8	149.78	0.76	9.9972047	47.8	9 40 20.53
27	300	213 44 41.9	43 52.4	149.87	0.67	9.9970902	47.6	9 36 24.62
28	301	214 44 39.8	43 50.2	149.96	− 0.55	9.9969761	− 47.5	9 32 28.71
29	302	215 44 39.7	43 50.0	150.04	0.42	9.9968623	47.4	9 28 32.80
30	303	216 44 41.5	43 51.7	150.12	0.28	9.9967488	47.3	9 24 36.89
31	304	217 44 45.3	43 55.4	150.19	0.15	9.9966357	47.1	9 20 40.98
32	305	218 44 51.1	44 1.1	150.27	− 0.02	9.9965230	− 46.9	9 16 45.07

Note.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 48.1	14 46.6	54 12.3	− 0.51	54 6.8	− 0.41	δ		0.3
2	14 45.4	14 44.6	54 2.6	0.30	53 59.7	− 0.18	0 40.0	1.81	1.3
3	14 44.2	14 44.2	53 58.2	− 0.07	53 58.2	+ 0.07	1 23.9	1.85	2.3
4	14 44.7	14 45.6	53 59.9	+ 0.22	54 3.4	+ 0.37	2 8.9	1.90	3.3
5	14 47.1	14 49.1	54 8.8	0.53	54 16.2	0.70	2 55.2	1.96	4.3
6	14 51.7	14 54.9	54 25.7	0.87	54 37.3	1.06	3 42.7	2.01	5.3
7	14 58.7	15 3.1	54 51.2	+ 1.25	55 7.4	+ 1.44	4 31.4	2.05	6.3
8	15 8.1	15 13.7	55 25.8	1.62	55 46.5	1.81	5 21.0	2.08	7.3
9	15 19.1	15 26.6	56 9.3	1.97	56 33.9	2.12	6 11.2	2.10	8.3
10	15 33.8	15 41.4	57 0.3	+ 2.26	57 28.1	+ 2.36	7 1.9	2.12	9.3
11	15 49.2	15 57.1	57 56.8	2.42	58 26.0	2.43	7 53.0	2.14	10.3
12	16 5.1	16 12.8	58 55.1	2.40	59 23.5	2.31	8 44.7	2.17	11.3
13	16 20.1	16 26.9	59 50.5	+ 2.16	60 15.3	+ 1.94	9 37.4	2.22	12.3
14	16 32.9	16 37.8	60 37.2	1.67	60 55.5	1.35	10 31.6	2.29	13.3
15	16 41.7	16 44.3	61 9.6	0.98	61 19.1	+ 0.58	11 27.6	2.38	14.3
16	16 45.5	16 45.3	61 23.6	+ 0.17	61 23.0	− 0.26	12 25.6	2.46	15.3
17	16 43.8	16 40.9	61 17.3	− 0.67	61 6.8	1.05	13 25.3	2.52	16.3
18	16 36.9	16 31.8	60 52.0	1.39	60 33.3	1.69	14 25.9	2.52	17.3
19	16 25.9	16 19.3	60 11.5	− 1.92	59 47.2	− 2.10	15 25.9	2.47	18.3
20	16 12.2	16 4.8	59 21.2	2.22	58 54.0	2.28	16 23.9	2.36	19.3
21	15 57.3	15 49.8	58 26.4	2.29	57 59.0	2.26	17 19.0	2.22	20.3
22	15 42.5	15 35.4	57 32.1	− 2.20	57 6.2	− 2.10	18 10.8	2.09	21.3
23	15 28.7	15 22.4	56 41.6	1.98	56 18.5	1.86	18 59.4	1.96	22.3
24	15 16.6	15 11.3	55 57.1	1.71	55 37.5	1.56	19 45.5	1.87	23.3
25	15 6.4	15 2.1	55 19.8	− 1.40	55 3.9	− 1.25	20 29.7	1.81	24.3
26	14 58.3	14 55.0	54 49.9	1.09	54 37.7	0.95	21 12.8	1.78	25.3
27	14 52.1	14 49.7	54 27.2	0.81	54 18.4	0.67	21 55.4	1.78	26.3
28	14 47.7	14 46.2	54 11.1	− 0.55	54 5.3	− 0.42	22 38.2	1.80	27.3
29	14 45.0	14 44.2	54 1.0	0.31	53 58.0	− 0.20	23 21.8	1.84	28.3
30	14 43.7	14 43.6	53 56.3	− 0.08	53 56.0	+ 0.02	δ		29.3
31	14 43.9	14 44.5	53 56.9	+ 0.12	53 59.1	0.23	0 6.5	1.89	0.5
32	14 45.4	14 46.7	54 2.6	+ 0.34	54 7.4	+ 0.46	0 52.4	1.94	1.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 1.					WEDNESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 36 25.16	1.9017	S. 6 2 4.2	9.369	0	14 8 48.18	1.9573	S. 12 48 49.4	7.361
1	12 38 19.28	1.9022	6 11 25.5	9.341	1	14 10 45.67	1.9590	12 56 9.4	7.306
2	12 40 13.43	1.9028	6 20 45.1	9.312	2	14 12 43.26	1.9607	13 3 26.1	7.250
3	12 42 7.62	1.9034	6 30 2.9	9.282	3	14 14 40.96	1.9625	13 10 39.4	7.193
4	12 44 1.84	1.9040	6 39 19.0	9.252	4	14 16 38.76	1.9643	13 17 49.3	7.136
5	12 45 56.10	1.9046	6 48 33.2	9.222	5	14 18 36.67	1.9661	13 24 55.7	7.078
6	12 47 50.39	1.9053	6 57 45.6	9.191	6	14 20 34.69	1.9679	13 31 58.7	7.021
7	12 49 44.73	1.9060	7 6 56.1	9.158	7	14 22 32.82	1.9697	13 38 58.2	6.962
8	12 51 39.11	1.9067	7 16 4.6	9.126	8	14 24 31.05	1.9714	13 45 54.1	6.902
9	12 53 33.53	1.9074	7 25 11.2	9.093	9	14 26 29.39	1.9733	13 52 46.5	6.843
10	12 55 28.00	1.9082	7 34 15.8	9.060	10	14 28 27.84	1.9752	13 59 35.3	6.783
11	12 57 22.52	1.9090	7 43 18.4	9.026	11	14 30 26.41	1.9771	14 6 20.5	6.722
12	12 59 17.08	1.9098	7 52 18.9	8.991	12	14 32 25.09	1.9789	14 13 2.0	6.661
13	13 1 11.70	1.9108	8 1 17.3	8.955	13	14 34 23.88	1.9808	14 19 39.8	6.599
14	13 3 6.37	1.9117	8 10 13.5	8.919	14	14 36 22.78	1.9827	14 26 13.9	6.537
15	13 5 1.10	1.9127	8 19 7.6	8.883	15	14 38 21.80	1.9646	14 32 44.3	6.475
16	13 6 55.89	1.9136	8 27 59.5	8.846	16	14 40 20.93	1.9865	14 39 10.9	6.411
17	13 8 50.73	1.9145	8 36 49.1	8.808	17	14 42 20.18	1.9884	14 45 33.7	6.348
18	13 10 45.63	1.9156	8 45 36.5	8.770	18	14 44 19.54	1.9903	14 51 52.7	6.284
19	13 12 40.60	1.9167	8 54 21.5	8.731	19	14 46 19.02	1.9923	14 58 7.8	6.219
20	13 14 35.63	1.9177	9 3 4.2	8.692	20	14 48 18.62	1.9943	15 4 19.0	6.154
21	13 16 30.72	1.9188	9 11 44.5	8.652	21	14 50 18.34	1.9962	15 10 26.3	6.088
22	13 18 25.88	1.9199	9 20 22.4	8.611	22	14 52 18.17	1.9982	15 16 29.6	6.023
23	13 20 21.11	1.9210	S. 9 28 57.8	8.570	23	14 54 18.12	2.0002	S. 15 22 29.0	5.957
	TUESDAY 2.					THURSDAY 4.			
0	13 22 16.40	1.9222	S. 9 37 30.8	8.528	0	14 56 18.19	2.0022	S. 15 28 24.4	5.889
1	13 24 11.77	1.9234	9 46 1.2	8.486	1	14 58 18.38	2.0042	15 34 15.7	5.821
2	13 26 7.21	1.9246	9 54 29.1	8.443	2	15 0 18.69	2.0062	15 40 2.9	5.753
3	13 28 2.72	1.9258	10 2 54.4	8.400	3	15 2 19.13	2.0082	15 45 46.1	5.685
4	13 29 58.31	1.9271	10 11 17.1	8.356	4	15 4 19.68	2.0102	15 51 25.1	5.616
5	13 31 53.98	1.9285	10 19 37.1	8.312	5	15 6 20.35	2.0122	15 57 0.0	5.547
6	13 33 49.73	1.9298	10 27 54.5	8.267	6	15 8 21.15	2.0143	16 2 30.7	5.477
7	13 35 45.56	1.9312	10 36 9.1	8.221	7	15 10 22.07	2.0163	16 7 57.2	5.406
8	13 37 41.47	1.9325	10 44 21.0	8.175	8	15 12 23.11	2.0183	16 13 19.4	5.335
9	13 39 37.46	1.9339	10 52 30.1	8.128	9	15 14 24.27	2.0204	16 18 37.4	5.264
10	13 41 33.54	1.9353	11 0 36.4	8.081	10	15 16 25.56	2.0225	16 23 51.1	5.192
11	13 43 29.70	1.9367	11 8 39.8	8.033	11	15 18 26.97	2.0245	16 29 0.5	5.120
12	13 45 25.95	1.9382	11 16 40.3	7.984	12	15 20 28.50	2.0265	16 34 5.5	5.047
13	13 47 22.29	1.9397	11 24 37.9	7.935	13	15 22 30.15	2.0286	16 39 6.2	4.974
14	13 49 18.72	1.9412	11 32 32.5	7.886	14	15 24 31.93	2.0307	16 44 2.4	4.900
15	13 51 15.23	1.9427	11 40 24.2	7.837	15	15 26 33.83	2.0327	16 48 54.2	4.826
16	13 53 11.84	1.9442	11 48 12.9	7.786	16	15 28 35.85	2.0347	16 53 41.5	4.752
17	13 55 8.54	1.9458	11 55 58.5	7.734	17	15 30 38.00	2.0368	16 58 24.4	4.677
18	13 57 5.34	1.9474	12 3 41.0	7.682	18	15 32 40.27	2.0388	17 3 2.8	4.602
19	13 59 2.23	1.9490	12 11 20.4	7.630	19	15 34 42.66	2.0409	17 7 33.6	4.526
20	14 0 59.22	1.9507	12 18 56.6	7.577	20	15 36 45.18	2.0430	17 12 5.9	4.450
21	14 2 56.31	1.9523	12 26 29.7	7.524	21	15 38 47.82	2.0450	17 16 30.6	4.373
22	14 4 53.50	1.9540	12 33 59.5	7.470	22	15 40 50.58	2.0471	17 20 50.7	4.296
23	14 6 50.70	1.9557	12 41 26.1	● 7.416	23	15 42 53.47	2.0492	17 25 6.2	4.219
24	14 8 48.18	1.9573	S. 12 48 49.4	7.361	24	15 44 56.48	2.0512	S. 17 29 17.0	4.141

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 44 56.48	2.0512	S. 17 29 17.0	4.141
1	15 46 59.61	2.0532	17 33 23.1	4.062
2	15 49 2.86	2.0552	17 37 24.5	3.984
3	15 51 6.24	2.0573	17 41 21.2	3.905
4	15 53 9.74	2.0593	17 45 13.1	3.825
5	15 55 13.36	2.0613	17 49 0.2	3.745
6	15 57 17.10	2.0633	17 52 42.5	3.665
7	15 59 20.96	2.0653	17 56 20.0	3.584
8	16 1 24.94	2.0674	17 59 52.6	3.503
9	16 3 29.05	2.0694	18 3 20.4	3.422
10	16 5 33.27	2.0713	18 6 43.3	3.341
11	16 7 37.61	2.0733	18 10 1.3	3.258
12	16 9 42.07	2.0753	18 13 14.3	3.176
13	16 11 46.65	2.0773	18 16 22.4	3.093
14	16 13 51.35	2.0792	18 19 25.5	3.009
15	16 15 56.16	2.0812	18 22 23.5	2.925
16	16 18 1.09	2.0832	18 25 16.5	2.841
17	16 20 6.14	2.0852	18 28 4.5	2.757
18	16 22 11.31	2.0871	18 30 47.4	2.672
19	16 24 16.59	2.0890	18 33 25.2	2.587
20	16 26 21.99	2.0909	18 35 57.9	2.502
21	16 28 27.50	2.0927	18 38 25.5	2.417
22	16 30 33.12	2.0946	18 40 47.9	2.331
23	16 32 38.85	2.0965	S. 18 43 5.2	2.245

SATURDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 34 44.70	2.0984	S. 18 45 17.3	2.158
1	16 36 50.66	2.1002	18 47 24.1	2.070
2	16 38 56.73	2.1021	18 49 25.7	1.983
3	16 41 2.91	2.1039	18 51 22.1	1.896
4	16 43 9.20	2.1057	18 53 13.2	1.808
5	16 45 15.59	2.1074	18 54 59.0	1.720
6	16 47 22.09	2.1092	18 56 39.6	1.632
7	16 49 28.70	2.1110	18 58 14.8	1.542
8	16 51 35.41	2.1127	18 59 44.7	1.453
9	16 53 42.23	2.1145	19 1 9.2	1.363
10	16 55 49.15	2.1162	19 2 28.3	1.273
11	16 57 56.18	2.1180	19 3 42.0	1.184
12	17 0 3.31	2.1197	19 4 50.4	1.095
13	17 2 10.54	2.1213	19 5 53.4	1.004
14	17 4 17.87	2.1230	19 6 50.9	0.913
15	17 6 25.30	2.1247	19 7 42.9	0.822
16	17 8 32.83	2.1263	19 8 29.5	0.731
17	17 10 40.46	2.1279	19 9 10.6	0.640
18	17 12 48.17	2.1295	19 9 46.3	0.548
19	17 14 55.99	2.1311	19 10 16.4	0.456
20	17 17 3.90	2.1327	19 10 41.0	0.364
21	17 19 11.91	2.1342	19 11 0.1	0.272
22	17 21 20.01	2.1357	19 11 13.7	0.180
23	17 23 28.20	2.1372	19 11 21.7	− 0.087
24	17 25 36.48	2.1387	S. 19 11 24.1	+ 0.006

SUNDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 25 36.48	2.1387	S. 19 11 24.1	0.006
1	17 27 44.85	2.1402	19 11 21.0	0.099
2	17 29 53.31	2.1417	19 11 12.2	0.193
3	17 32 1.86	2.1432	19 10 57.8	0.287
4	17 34 10.49	2.1446	19 10 37.8	0.380
5	17 36 19.21	2.1461	19 10 12.2	0.473
6	17 38 28.02	2.1475	19 9 41.0	0.567
7	17 40 36.91	2.1488	19 9 4.1	0.662
8	17 42 45.88	2.1502	19 8 21.6	0.756
9	17 44 54.94	2.1516	19 7 33.4	0.851
10	17 47 4.08	2.1529	19 6 39.5	0.946
11	17 49 13.29	2.1542	19 5 39.9	1.040
12	17 51 22.58	2.1555	19 4 34.7	1.134
13	17 53 31.95	2.1568	19 3 23.8	1.229
14	17 55 41.40	2.1581	19 2 7.2	1.324
15	17 57 50.92	2.1593	19 0 44.9	1.420
16	18 0 0.51	2.1605	18 59 16.8	1.516
17	18 2 10.18	2.1617	18 57 43.0	1.611
18	18 4 19.92	2.1629	18 56 3.5	1.706
19	18 6 29.73	2.1641	18 54 18.3	1.802
20	18 8 39.61	2.1652	18 52 27.3	1.897
21	18 10 49.56	2.1664	18 50 30.6	1.993
22	18 12 59.58	2.1675	18 48 28.1	2.089
23	18 15 9.66	2.1686	S. 18 46 19.9	2.184

MONDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 17 19.81	2.1697	S. 18 44 6.0	2.280
1	18 19 30.03	2.1708	18 41 46.3	2.377
2	18 21 40.31	2.1718	18 39 20.8	2.473
3	18 23 50.65	2.1728	18 36 49.6	2.568
4	18 26 1.05	2.1738	18 34 12.6	2.664
5	18 28 11.51	2.1749	18 31 29.9	2.760
6	18 30 22.04	2.1760	18 28 41.4	2.857
7	18 32 32.63	2.1769	18 25 47.1	2.953
8	18 34 43.27	2.1778	18 22 47.1	3.048
9	18 36 53.97	2.1787	18 19 41.3	3.144
10	18 39 4.72	2.1797	18 16 29.8	3.240
11	18 41 15.53	2.1807	18 13 12.5	3.337
12	18 43 26.40	2.1816	18 9 49.4	3.433
13	18 45 37.32	2.1824	18 6 20.6	3.528
14	18 47 48.29	2.1833	18 2 46.0	3.624
15	18 49 59.32	2.1842	17 59 5.7	3.720
16	18 52 10.40	2.1851	17 55 19.6	3.816
17	18 54 21.53	2.1859	17 51 27.8	3.912
18	18 56 32.71	2.1867	17 47 30.2	4.007
19	18 58 43.94	2.1876	17 43 26.9	4.102
20	19 0 55.22	2.1883	17 39 17.9	4.197
21	19 3 6.54	2.1891	17 35 3.2	4.293
22	19 5 17.91	2.1899	17 30 42.7	4.389
23	19 7 29.33	2.1907	17 26 16.5	4.484
24	19 9 40.80	2.1915	S. 17 21 44.6	4.579

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 9 40.80	2.1915	S. 17 21 44.6	4.579
1	19 11 52.31	2.1922	17 17 7.0	4.673
2	19 14 3.86	2.1929	17 12 23.8	4.768
3	19 16 15.46	2.1937	17 7 34.9	4.863
4	19 18 27.10	2.1944	17 2 40.3	4.958
5	19 20 38.79	2.1952	16 57 40.0	5.052
6	19 22 50.52	2.1958	16 52 34.1	5.145
7	19 25 2.29	2.1965	16 47 22.6	5.239
8	19 27 14.10	2.1972	16 42 5.4	5.333
9	19 29 25.95	2.1978	16 36 42.6	5.427
10	19 31 37.84	2.1985	16 31 14.2	5.520
11	19 33 49.77	2.1992	16 25 40.2	5.613
12	19 36 1.75	2.1999	16 20 0.6	5.706
13	19 38 13.76	2.2005	16 14 15.5	5.798
14	19 40 25.81	2.2012	16 8 24.8	5.891
15	19 42 37.91	2.2020	16 2 28.6	5.982
16	19 44 50.05	2.2026	15 56 26.9	6.074
17	19 47 2.22	2.2032	15 50 19.7	6.167
18	19 49 14.43	2.2038	15 44 6.9	6.258
19	19 51 26.68	2.2045	15 37 48.7	6.349
20	19 53 38.97	2.2052	15 31 25.0	6.440
21	19 55 51.30	2.2058	15 24 55.9	6.530
22	19 58 3.66	2.2063	15 18 21.4	6.620
23	20 0 16.06	2.2070	S. 15 11 41.5	6.710

WEDNESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 2 28.50	2.2077	S. 15 4 56.2	6.800
1	20 4 40.98	2.2083	14 58 5.5	6.889
2	20 6 53.50	2.2090	14 51 9.5	6.977
3	20 9 6.06	2.2097	14 44 8.2	7.066
4	20 11 18.66	2.2103	14 37 1.6	7.154
5	20 13 31.30	2.2109	14 29 49.7	7.242
6	20 15 43.97	2.2115	14 22 32.6	7.329
7	20 17 56.68	2.2121	14 15 10.2	7.416
8	20 20 9.43	2.2128	14 7 42.6	7.502
9	20 22 22.22	2.2136	14 0 9.9	7.588
10	20 24 35.06	2.2143	13 52 32.0	7.675
11	20 26 47.94	2.2150	13 44 48.9	7.761
12	20 29 0.86	2.2157	13 37 0.7	7.845
13	20 31 13.82	2.2163	13 29 7.5	7.929
14	20 33 26.82	2.2170	13 21 9.2	8.013
15	20 35 39.86	2.2177	13 13 5.9	8.096
16	20 37 52.95	2.2185	13 4 57.6	8.179
17	20 40 6.08	2.2192	12 56 44.4	8.262
18	20 42 19.25	2.2199	12 48 26.2	8.344
19	20 44 32.47	2.2207	12 40 3.1	8.425
20	20 46 45.73	2.2214	12 31 35.2	8.506
21	20 48 59.04	2.2222	12 23 2.4	8.587
22	20 51 12.40	2.2231	12 14 24.8	8.667
23	20 53 25.81	2.2238	12 5 42.4	8.746
24	20 55 39.26	2.2246	S. 11 56 55.3	8.824

THURSDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 55 39.26	2.2246	S. 11 56 55.3	8.824
1	20 57 52.76	2.2254	11 48 3.5	8.902
2	21 0 6.31	2.2262	11 39 7.1	8.979
3	21 2 19.91	2.2271	11 30 6.0	9.056
4	21 4 33.56	2.2280	11 21 0.3	9.132
5	21 6 47.27	2.2289	11 11 50.1	9.208
6	21 9 1.03	2.2298	11 2 35.3	9.283
7	21 11 14.84	2.2307	10 53 16.1	9.357
8	21 13 28.71	2.2317	10 43 52.4	9.431
9	21 15 42.64	2.2327	10 34 24.3	9.505
10	21 17 56.63	2.2336	10 24 51.8	9.577
11	21 20 10.67	2.2345	10 15 15.0	9.648
12	21 22 24.77	2.2355	10 5 34.0	9.719
13	21 24 38.93	2.2365	9 55 48.7	9.790
14	21 26 53.15	2.2376	9 45 59.2	9.859
15	21 29 7.44	2.2387	9 36 5.6	9.927
16	21 31 21.79	2.2398	9 26 7.9	9.995
17	21 33 36.21	2.2409	9 16 6.2	10.063
18	21 35 50.70	2.2420	9 6 0.4	10.130
19	21 38 5.25	2.2431	8 55 50.6	10.195
20	21 40 19.87	2.2443	8 45 37.0	10.259
21	21 42 34.57	2.2456	8 35 19.5	10.323
22	21 44 49.34	2.2467	8 24 58.2	10.387
23	21 47 4.18	2.2479	S. 8 14 33.1	10.449

FRIDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 49 19.09	2.2492	S. 8 4 4.3	10.511
1	21 51 34.08	2.2505	7 53 31.8	10.572
2	21 53 49.15	2.2518	7 42 55.7	10.631
3	21 56 4.30	2.2532	7 32 16.1	10.689
4	21 58 19.53	2.2546	7 21 33.0	10.747
5	22 0 34.85	2.2560	7 10 46.4	10.805
6	22 2 50.25	2.2574	6 59 56.4	10.861
7	22 5 5.74	2.2588	6 49 3.1	10.916
8	22 7 21.31	2.2602	6 38 6.5	10.970
9	22 9 36.97	2.2617	6 27 6.7	11.023
10	22 11 52.72	2.2633	6 16 3.8	11.075
11	22 14 8.57	2.2649	6 4 57.7	11.127
12	22 16 24.51	2.2665	5 53 48.6	11.176
13	22 18 40.55	2.2681	5 42 36.6	11.225
14	22 20 56.68	2.2697	5 31 21.6	11.274
15	22 23 12.91	2.2713	5 20 3.7	11.322
16	22 25 29.24	2.2731	5 8 43.0	11.368
17	22 27 45.68	2.2748	4 57 19.6	11.412
18	22 30 2.22	2.2766	4 45 53.6	11.455
19	22 32 18.87	2.2783	4 34 25.0	11.498
20	22 34 35.62	2.2801	4 22 53.8	11.540
21	22 36 52.48	2.2820	4 11 20.2	11.580
22	22 39 9.46	2.2839	3 59 44.2	11.619
23	22 41 26.55	2.2858	3 48 5.9	11.658
24	22 43 43.75	2.2877	S. 3 36 25.3	11.695

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	SATURDAY 13.					MONDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 43 43.75	2.2877	S. 3 36 25.3	11.695	0	0 36 18.75	2.4131	N. 6 2 19.5	11.860
1	22 46 1.07	2.2897	3 24 42.5	11.730	1	0 38 43.63	2.4162	6 14 10.1	11.826
2	22 48 18.51	2.2916	3 12 57.7	11.764	2	0 41 8.70	2.4194	6 25 58.6	11.789
3	22 50 36.06	2.2936	3 1 10.8	11.798	3	0 43 33.96	2.4225	6 37 44.8	11.751
4	22 52 53.74	2.2957	2 49 21.9	11.831	4	0 45 59.40	2.4256	6 49 28.7	11.712
5	22 55 11.55	2.2978	2 37 31.1	11.862	5	0 48 25.03	2.4287	7 1 10.3	11.672
6	22 57 29.48	2.2999	2 25 38.5	11.892	6	0 50 50.85	2.4319	7 12 49.4	11.630
7	22 59 47.54	2.3021	2 13 44.1	11.920	7	0 53 16.86	2.4352	7 24 25.9	11.586
8	23 2 5.73	2.3042	2 1 48.1	11.947	8	0 55 43.07	2.4384	7 35 59.7	11.541
9	23 4 24.05	2.3064	1 49 50.5	11.972	9	0 58 9.47	2.4416	7 47 30.8	11.494
10	23 6 42.50	2.3087	1 37 51.4	11.997	10	1 0 36.06	2.4447	7 58 59.0	11.445
11	23 9 1.09	2.3109	1 25 50.9	12.020	11	1 3 2.84	2.4479	8 10 24.2	11.394
12	23 11 19.81	2.3132	1 13 49.0	12.042	12	1 5 29.81	2.4511	8 21 46.3	11.342
13	23 13 38.67	2.3155	1 1 45.8	12.063	13	1 7 56.97	2.4543	8 33 5.2	11.288
14	23 15 57.67	2.3179	0 49 41.4	12.082	14	1 10 24.32	2.4575	8 44 20.9	11.233
15	23 18 16.82	2.3203	0 37 36.0	12.099	15	1 12 51.87	2.4607	8 55 33.2	11.176
16	23 20 36.11	2.3227	0 25 29.5	12.116	16	1 15 19.61	2.4638	9 6 42.0	11.117
17	23 22 55.54	2.3251	0 13 22.0	12.132	17	1 17 47.53	2.4669	9 17 47.3	11.057
18	23 25 15.12	2.3276	S. 0 1 13.7	12.145	18	1 20 15.64	2.4701	9 28 48.9	10.995
19	23 27 34.85	2.3301	N. 0 10 55.4	12.157	19	1 22 43.94	2.4732	9 39 46.7	10.932
20	23 29 54.73	2.3326	0 23 5.2	12.168	20	1 25 12.43	2.4764	9 50 40.7	10.867
21	23 32 14.76	2.3352	0 35 15.6	12.178	21	1 27 41.11	2.4795	10 1 30.7	10.800
22	23 34 34.95	2.3377	0 47 26.6	12.187	22	1 30 9.97	2.4826	10 12 16.7	10.732
23	23 36 55.29	2.3403	N. 0 59 38.0	12.193	23	1 32 39.02	2.4857	N.10 22 58.5	10.662
	SUNDAY 14.					TUESDAY 16.			
0	23 39 15.79	2.3430	N. 1 11 49.7	12.198	0	1 35 8.25	2.4887	N.10 33 36.1	10.591
1	23 41 36.45	2.3457	1 24 1.7	12.202	1	1 37 37.67	2.4918	10 44 9.4	10.518
2	23 43 57.27	2.3483	1 36 13.9	12.203	2	1 40 7.27	2.4948	10 54 38.2	10.443
3	23 46 18.25	2.3510	1 48 26.1	12.203	3	1 42 37.05	2.4978	11 5 2.5	10.367
4	23 48 39.39	2.3538	2 0 38.3	12.203	4	1 45 7.01	2.5008	11 15 22.2	10.289
5	23 51 0.70	2.3566	2 12 50.5	12.202	5	1 47 37.15	2.5037	11 25 37.2	10.209
6	23 53 22.18	2.3594	2 25 2.5	12.198	6	1 50 7.46	2.5067	11 35 47.3	10.128
7	23 55 43.83	2.3622	2 37 14.2	12.192	7	1 52 37.95	2.5096	11 45 52.5	10.046
8	23 58 5.65	2.3650	2 49 25.5	12.185	8	1 55 8.61	2.5125	11 55 52.8	9.963
9	0 0 27.63	2.3678	3 1 36.4	12.177	9	1 57 39.45	2.5154	12 5 48.1	9.878
10	0 2 49.78	2.3707	3 13 46.7	12.166	10	2 0 10.46	2.5182	12 15 38.2	9.791
11	0 5 12.11	2.3737	3 25 56.3	12.154	11	2 2 41.63	2.5209	12 25 23.0	9.702
12	0 7 34.62	2.3766	3 38 5.2	12.142	12	2 5 12.97	2.5237	12 35 2.4	9.612
13	0 9 57.30	2.3795	3 50 13.3	12.127	13	2 7 44.48	2.5265	12 44 36.4	9.522
14	0 12 20.16	2.3825	4 2 20.4	12.110	14	2 10 16.15	2.5291	12 54 5.0	9.430
15	0 14 43.20	2.3855	4 14 26.5	12.092	15	2 12 47.97	2.5317	13 3 28.0	9.336
16	0 17 6.42	2.3885	4 26 31.5	12.073	16	2 15 19.95	2.5342	13 12 45.3	9.240
17	0 19 29.82	2.3915	4 38 35.3	12.052	17	2 17 52.08	2.5368	13 21 56.8	9.143
18	0 21 53.40	2.3945	4 50 37.8	12.030	18	2 20 24.37	2.5394	13 31 2.5	9.046
19	0 24 17.16	2.3976	5 2 38.9	12.005	19	2 22 56.81	2.5418	13 40 2.3	8.947
20	0 26 41.11	2.4007	5 14 38.4	11.978	20	2 25 29.39	2.5442	13 48 56.1	8.846
21	0 29 5.24	2.4037	5 26 36.3	11.951	21	2 28 2.11	2.5465	13 57 43.8	8.744
22	0 31 29.56	2.4068	5 38 32.5	11.922	22	2 30 34.97	2.5488	14 6 25.4	8.641
23	0 33 54.06	2.4099	5 50 26.9	11.892	23	2 33 7.97	2.5511	14 15 0.7	8.536
24	0 36 18.75	2.4131	N. 6 2 19.5	11.860	24	2 35 41.11	2.5533	N.14 23 29.7	8.430

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 35 41.11	2.5533	N.14 23 29.7	8.430	0	4 39 26.35	2.5713	N.18 48 48.9	2.393
1	2 38 14.37	2.5554	14 31 52.3	8.323	1	4 42 0.58	2.5696	18 51 8.4	2.258
2	2 40 47.76	2.5576	14 40 8.5	8.216	2	4 44 34.70	2.5677	18 53 19.8	2.123
3	2 43 21.28	2.5597	14 48 18.2	8.107	3	4 47 8.70	2.5657	18 55 23.2	1.989
4	2 45 54.92	2.5616	14 56 21.3	7.997	4	4 49 42.58	2.5637	18 57 18.5	1.854
5	2 48 28.67	2.5634	15 4 17.8	7.885	5	4 52 16.34	2.5616	18 59 5.7	1.720
6	2 51 2.53	2.5653	15 12 7.5	7.772	6	4 54 49.97	2.5594	19 0 44.9	1.586
7	2 53 36.50	2.5671	15 19 50.4	7.658	7	4 57 23.47	2.5571	19 2 16.1	1.452
8	2 56 10.58	2.5688	15 27 26.5	7.544	8	4 59 56.82	2.5547	19 3 39.2	1.318
9	2 58 44.76	2.5704	15 34 55.7	7.428	9	5 2 30.03	2.5522	19 4 54.3	1.185
10	3 1 19.03	2.5720	15 42 17.9	7.312	10	5 5 3.09	2.5497	19 6 1.4	1.052
11	3 3 53.40	2.5736	15 49 33.1	7.194	11	5 7 35.99	2.5470	19 7 0.5	0.919
12	3 6 27.86	2.5750	15 56 41.2	7.076	12	5 10 8.73	2.5442	19 7 51.7	0.787
13	3 9 2.40	2.5763	16 3 42.2	6.956	13	5 12 41.30	2.5415	19 8 35.0	0.656
14	3 11 37.02	2.5776	16 10 35.9	6.834	14	5 15 13.71	2.5387	19 9 10.4	0.524
15	3 14 11.72	2.5789	16 17 22.3	6.713	15	5 17 45.94	2.5357	19 9 37.9	0.392
16	3 16 46.49	2.5800	16 24 1.4	6.591	16	5 20 17.99	2.5326	19 9 57.5	0.261
17	3 19 21.32	2.5810	16 30 33.2	6.468	17	5 22 49.85	2.5294	19 10 9.2	0.130
18	3 21 56.21	2.5820	16 36 57.6	6.344	18	5 25 21.52	2.5262	19 10 13.1	+ 0.001
19	3 24 31.16	2.5829	16 43 14.5	6.219	19	5 27 53.00	2.5230	19 10 9.3	− 0.128
20	3 27 6.16	2.5837	16 49 23.9	6.094	20	5 30 24.28	2.5196	19 9 57.7	0.257
21	3 29 41.21	2.5845	16 55 25.8	5.968	21	5 32 55.35	2.5161	19 9 38.4	0.386
22	3 32 16.30	2.5852	17 1 20.1	5.842	22	5 35 26.21	2.5126	19 9 11.4	0.513
23	3 34 51.43	2.5857	N.17 7 6.8	5.714	23	5 37 56.86	2.5091	N.19 8 36.8	0.640
	THURSDAY 18.					SATURDAY 20.			
0	3 37 26.59	2.5862	N.17 12 45.8	5.586	0	5 40 27.30	2.5054	N.19 7 54.6	0.767
1	3 40 1.78	2.5867	17 18 17.1	5.457	1	5 42 57.51	2.5017	19 7 4.8	0.893
2	3 42 36.99	2.5870	17 23 40.6	5.328	2	5 45 27.50	2.4979	19 6 7.5	1.018
3	3 45 12.22	2.5872	17 28 56.4	5.198	3	5 47 57.26	2.4940	19 5 2.6	1.143
4	3 47 47.46	2.5873	17 34 4.4	5.067	4	5 50 26.78	2.4901	19 3 50.3	1.266
5	3 50 22.70	2.5874	17 39 4.5	4.936	5	5 52 56.07	2.4862	19 2 30.6	1.389
6	3 52 57.95	2.5874	17 43 56.7	4.804	6	5 55 25.12	2.4821	19 1 3.6	1.512
7	3 55 33.19	2.5873	17 48 41.0	4.673	7	5 57 53.92	2.4780	18 59 29.2	1.634
8	3 58 8.42	2.5871	17 53 17.4	4.541	8	6 0 22.48	2.4738	18 57 47.5	1.755
9	4 0 43.64	2.5868	17 57 45.9	4.408	9	6 2 50.78	2.4695	18 55 58.6	1.875
10	4 3 18.84	2.5864	18 2 6.4	4.275	10	6 5 18.82	2.4653	18 54 2.5	1.995
11	4 5 54.01	2.5859	18 6 18.9	4.142	11	6 7 46.61	2.4610	18 51 59.2	2.114
12	4 8 29.15	2.5853	18 10 23.5	4.009	12	6 10 14.14	2.4566	18 49 48.8	2.232
13	4 11 4.25	2.5847	18 14 20.0	3.875	13	6 12 41.40	2.4521	18 47 31.3	2.350
14	4 13 39.31	2.5839	18 18 8.5	3.741	14	6 15 8.39	2.4476	18 45 6.8	2.466
15	4 16 14.32	2.5831	18 21 48.9	3.606	15	6 17 35.11	2.4431	18 42 35.4	2.581
16	4 18 49.28	2.5822	18 25 21.2	3.472	16	6 20 1.56	2.4386	18 39 57.1	2.696
17	4 21 24.18	2.5811	18 28 45.5	3.337	17	6 22 27.74	2.4340	18 37 11.9	2.810
18	4 23 59.01	2.5799	18 32 1.7	3.202	18	6 24 53.64	2.4293	18 34 19.9	2.923
19	4 26 33.77	2.5787	18 35 9.8	3.067	19	6 27 19.25	2.4245	18 31 21.1	3.036
20	4 29 8.46	2.5775	18 38 9.8	2.932	20	6 29 44.58	2.4197	18 28 15.6	3.147
21	4 31 43.07	2.5761	18 41 1.7	2.797	21	6 32 9.62	2.4150	18 25 3.5	3.257
22	4 34 17.59	2.5746	18 43 45.5	2.662	22	6 34 34.38	2.4102	18 21 44.8	3.367
23	4 36 52.02	2.5730	18 46 21.2	2.528	23	6 36 58.84	2.4053	18 18 19.5	3.476
24	4 39 26.35	2.5713	N.18 48 48.9	2.393	24	6 39 23.01	2.4004	N.18 14 47.7	3.583

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 39 23.01	2.4004	N.18 14 47.7	3.583
1	6 41 46.89	2.3955	18 11 9.5	3.690
2	6 44 10.47	2.3905	18 7 24.9	3.796
3	6 46 33.75	2.3855	18 3 34.0	3.901
4	6 48 56.73	2.3805	17 59 36.8	4.005
5	6 51 19.41	2.3755	17 55 33.4	4.107
6	6 53 41.79	2.3704	17 51 23.9	4.209
7	6 56 3.86	2.3653	17 47 8.3	4.311
8	6 58 25.63	2.3602	17 42 46.6	4.412
9	7 0 47.09	2.3551	17 38 18.9	4.511
10	7 3 8.24	2.3499	17 33 45.3	4.609
11	7 5 29.08	2.3447	17 29 5.8	4.707
12	7 7 49.61	2.3396	17 24 20.5	4.803
13	7 10 9.83	2.3344	17 19 29.4	4.898
14	7 12 29.74	2.3292	17 14 32.7	4.992
15	7 14 49.34	2.3240	17 9 30.4	5.085
16	7 17 8.62	2.3188	17 4 22.5	5.178
17	7 19 27.59	2.3136	16 59 9.0	5.270
18	7 21 46.25	2.3083	16 53 50.1	5.360
19	7 24 4.59	2.3031	16 48 25.8	5.450
20	7 26 22.62	2.2979	16 42 56.1	5.538
21	7 28 40.34	2.2927	16 37 21.2	5.625
22	7 30 57.74	2.2874	16 31 41.1	5.712
23	7 33 14.83	2.2822	N.16 25 55.8	5.797

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 35 31.61	2.2770	N.16 20 5.4	5.882
1	7 37 48.07	2.2718	16 14 10.0	5.965
2	7 40 4.22	2.2666	16 8 9.6	6.048
3	7 42 20.06	2.2613	16 2 4.2	6.130
4	7 44 35.58	2.2561	15 55 54.0	6.210
5	7 46 50.79	2.2509	15 49 39.0	6.289
6	7 49 5.69	2.2457	15 43 19.3	6.367
7	7 51 20.28	2.2406	15 36 54.9	6.445
8	7 53 34.56	2.2354	15 30 25.9	6.522
9	7 55 48.52	2.2302	15 23 52.3	6.597
10	7 58 2.18	2.2251	15 17 14.2	6.672
11	8 0 15.53	2.2200	15 10 31.6	6.746
12	8 2 28.58	2.2149	15 3 44.7	6.819
13	8 4 41.32	2.2098	14 56 53.4	6.891
14	8 6 53.76	2.2047	14 49 57.8	6.961
15	8 9 5.89	2.1997	14 42 58.1	7.030
16	8 11 17.72	2.1947	14 35 54.2	7.099
17	8 13 29.25	2.1897	14 28 46.2	7.167
18	8 15 40.49	2.1848	14 21 34.1	7.235
19	8 17 51.43	2.1798	14 14 18.0	7.301
20	8 20 2.07	2.1748	14 6 58.0	7.365
21	8 22 12.41	2.1699	13 59 34.2	7.429
22	8 24 22.46	2.1651	13 52 6.5	7.492
23	8 26 32.22	2.1602	13 44 35.1	7.554
24	8 28 41.69	2.1554	N.13 37 0.0	7.616

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 28 41.69	2.1554	N.13 37 0.0	7.616
1	8 30 50.87	2.1507	13 29 21.2	7.676
2	8 32 59.77	2.1459	13 21 38.9	7.735
3	8 35 8.38	2.1412	13 13 53.0	7.794
4	8 37 16.71	2.1365	13 6 3.6	7.852
5	8 39 24.76	2.1319	12 58 10.8	7.908
6	8 41 32.54	2.1273	12 50 14.6	7.964
7	8 43 40.04	2.1227	12 42 15.1	8.019
8	8 45 47.26	2.1181	12 34 12.3	8.073
9	8 47 54.21	2.1136	12 26 6.3	8.126
10	8 50 0.89	2.1091	12 17 57.1	8.178
11	8 52 7.30	2.1047	12 9 44.9	8.229
12	8 54 13.45	2.1002	12 1 29.6	8.280
13	8 56 19.33	2.0959	11 53 11.3	8.330
14	8 58 24.95	2.0916	11 44 50.0	8.378
15	9 0 30.32	2.0873	11 36 25.9	8.426
16	9 2 35.43	2.0831	11 27 58.9	8.473
17	9 4 40.29	2.0788	11 19 29.1	8.519
18	9 6 44.89	2.0746	11 10 56.6	8.564
19	9 8 49.24	2.0705	11 2 21.4	8.609
20	9 10 53.35	2.0664	10 53 43.5	8.653
21	9 12 57.21	2.0623	10 45 3.0	8.696
22	9 15 0.83	2.0583	10 36 20.0	8.738
23	9 17 4.21	2.0544	N.10 27 34.5	8.779

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 19 7.36	2.0505	N.10 18 46.5	8.820
1	9 21 10.27	2.0466	10 9 56.1	8.859
2	9 23 12.95	2.0428	10 1 3.4	8.898
3	9 25 15.41	2.0391	9 52 8.4	8.936
4	9 27 17.64	2.0353	9 43 11.1	8.972
5	9 29 19.64	2.0315	9 34 11.7	9.008
6	9 31 21.42	2.0278	9 25 10.1	9.044
7	9 33 22.98	2.0242	9 16 6.4	9.079
8	9 35 24.33	2.0207	9 7 0.6	9.113
9	9 37 25.47	2.0172	8 57 52.8	9.147
10	9 39 26.40	2.0137	8 48 43.0	9.179
11	9 41 27.12	2.0102	8 39 31.3	9.210
12	9 43 27.63	2.0068	8 30 17.8	9.241
13	9 45 27.94	2.0036	8 21 2.4	9.272
14	9 47 28.06	2.0003	8 11 45.2	9.301
15	9 49 27.98	1.9971	8 2 26.3	9.329
16	9 51 27.71	1.9939	7 53 5.7	9.357
17	9 53 27.25	1.9908	7 43 43.4	9.385
18	9 55 26.60	1.9877	7 34 19.5	9.412
19	9 57 25.77	1.9847	7 24 54.0	9.437
20	9 59 24.76	1.9817	7 15 27.0	9.462
21	10 1 23.57	1.9787	7 5 58.6	9.486
22	10 3 22.20	1.9757	6 56 28.7	9.510
23	10 5 20.65	1.9728	6 46 57.4	9.532
24	10 7 18.93	1.9700	N. 6 37 24.8	9.554

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 7 18.93	1.9700	N. 6 37 24.8	9.554
1	10 9 17.05	1.9673	6 27 50.9	9.576
2	10 11 15.01	1.9646	6 18 15.7	9.597
3	10 13 12.80	1.9619	6 8 39.3	9.617
4	10 15 10.44	1.9593	5 59 1.7	9.636
5	10 17 7.92	1.9567	5 49 23.0	9.655
6	10 19 5.25	1.9542	5 39 43.1	9.673
7	10 21 2.43	1.9517	5 30 2.2	9.690
8	10 22 59.46	1.9493	5 20 20.3	9.706
9	10 24 56.35	1.9470	5 10 37.5	9.722
10	10 26 53.10	1.9447	5 0 53.7	9.737
11	10 28 49.71	1.9423	4 51 9.0	9.752
12	10 30 46.18	1.9401	4 41 23.4	9.766
13	10 32 42.52	1.9380	4 31 37.0	9.779
14	10 34 38.74	1.9359	4 21 49.9	9.792
15	10 36 34.83	1.9338	4 12 2.0	9.804
16	10 38 30.79	1.9317	4 2 13.4	9.815
17	10 40 26.63	1.9297	3 52 24.2	9.825
18	10 42 22.36	1.9278	3 42 34.4	9.835
19	10 44 17.97	1.9259	3 32 44.0	9.844
20	10 46 13.47	1.9241	3 22 53.1	9.853
21	10 48 8.86	1.9223	3 13 1.6	9.861
22	10 50 4.14	1.9205	3 3 9.7	9.868
23	10 51 59.32	1.9188	N. 2 53 17.4	9.875

FRIDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 53 54.40	1.9172	N. 2 43 24.7	9.882
1	10 55 49.38	1.9156	2 33 31.6	9.887
2	10 57 44.27	1.9140	2 23 38.2	9.892
3	10 59 39.06	1.9125	2 13 44.6	9.895
4	11 1 33.77	1.9111	2 3 50.8	9.898
5	11 3 28.39	1.9096	1 53 56.8	9.901
6	11 5 22.92	1.9082	1 44 2.6	9.904
7	11 7 17.37	1.9069	1 34 8.3	9.906
8	11 9 11.75	1.9057	1 24 13.9	9.907
9	11 11 6.05	1.9044	1 14 19.4	9.908
10	11 13 0.28	1.9032	1 4 24.9	9.907
11	11 14 54.44	1.9021	0 54 30.5	9.906
12	11 16 48.53	1.9010	0 44 36.2	9.904
13	11 18 42.56	1.9000	0 34 42.0	9.903
14	11 20 36.53	1.8990	0 24 47.9	9.901
15	11 22 30.44	1.8980	0 14 53.9	9.897
16	11 24 24.29	1.8971	N. 0 5 0.2	9.892
17	11 26 18.09	1.8962	S. 0 4 53.2	9.888
18	11 28 11.84	1.8954	0 14 46.4	9.884
19	11 30 5.54	1.8947	0 24 39.3	9.878
20	11 31 59.20	1.8939	0 34 31.8	9.871
21	11 33 52.81	1.8932	0 44 23.8	9.863
22	11 35 46.38	1.8926	0 54 15.4	9.856
23	11 37 39.92	1.8920	1 4 6.5	9.848
24	11 39 33.42	1.8914	S. 1 13 57.2	9.840

SATURDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 39 33.42	1.8914	S. 1 13 57.2	9.840
1	11 41 26.89	1.8909	1 23 47.3	9.830
2	11 43 20.33	1.8904	1 33 36.8	9.821
3	11 45 13.74	1.8900	1 43 25.8	9.811
4	11 47 7.13	1.8897	1 53 14.1	9.799
5	11 49 0.50	1.8893	2 3 1.7	9.788
6	11 50 53.85	1.8890	2 12 48.6	9.776
7	11 52 47.18	1.8887	2 22 34.8	9.762
8	11 54 40.50	1.8886	2 32 20.1	9.748
9	11 56 33.81	1.8884	2 42 4.6	9.735
10	11 58 27.11	1.8883	2 51 48.3	9.721
11	12 0 20.40	1.8882	3 1 31.1	9.705
12	12 2 13.69	1.8882	3 11 12.9	9.689
13	12 4 6.98	1.8882	3 20 53.8	9.673
14	12 6 0.27	1.8882	3 30 33.7	9.656
15	12 7 53.56	1.8883	3 40 12.5	9.638
16	12 9 46.86	1.8883	3 49 50.3	9.620
17	12 11 40.16	1.8884	3 59 26.9	9.601
18	12 13 33.47	1.8886	4 9 2.4	9.582
19	12 15 26.79	1.8888	4 18 36.7	9.562
20	12 17 20.13	1.8892	4 28 9.8	9.542
21	12 19 13.49	1.8895	4 37 41.7	9.521
22	12 21 6.87	1.8898	4 47 12.3	9.499
23	12 23 0.27	1.8902	S. 4 56 41.5	9.476

SUNDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 24 53.69	1.8906	S. 5 6 9.4	9.453
1	12 26 47.14	1.8911	5 15 35.9	9.430
2	12 28 40.62	1.8915	5 25 1.0	9.406
3	12 30 34.12	1.8920	5 34 24.6	9.381
4	12 32 27.66	1.8926	5 43 46.7	9.356
5	12 34 21.24	1.8932	5 53 7.3	9.331
6	12 36 14.85	1.8938	6 2 26.4	9.305
7	12 38 8.50	1.8946	6 11 43.9	9.277
8	12 40 2.20	1.8953	6 20 59.7	9.249
9	12 41 55.94	1.8960	6 30 13.8	9.221
10	12 43 49.72	1.8968	6 39 26.2	9.192
11	12 45 43.55	1.8976	6 48 36.9	9.163
12	12 47 37.43	1.8984	6 57 45.8	9.133
13	12 49 31.36	1.8993	7 6 52.9	9.103
14	12 51 25.35	1.9002	7 15 58.2	9.072
15	12 53 19.39	1.9012	7 25 1.6	9.041
16	12 55 13.49	1.9022	7 34 3.1	9.008
17	12 57 7.65	1.9031	7 43 2.6	8.975
18	12 59 1.86	1.9041	7 52 0.1	8.942
19	13 0 56.14	1.9052	8 0 55.6	8.908
20	13 2 50.49	1.9063	8 9 49.1	8.874
21	13 4 44.90	1.9074	8 18 40.5	8.839
22	13 6 39.38	1.9086	8 27 29.8	8.803
23	13 8 33.93	1.9098	8 36 16.9	8.767
24	13 10 28.56	1.9111	S. 8 45 1.8	8.730

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 10 28.56	1.9111	S. 8 45 1.8	8.730
1	13 12 23.26	1.9123	8 53 44.5	8.692
2	13 14 18.03	1.9135	9 2 24.9	8.654
3	13 16 12.88	1.9148	9 11 3.0	8.616
4	13 18 7.81	1.9162	9 19 38.8	8.577
5	13 20 2.82	1.9175	9 28 12.2	8.537
6	13 21 57.91	1.9188	9 36 43.3	8.497
7	13 23 53.08	1.9202	9 45 11.9	8.456
8	13 25 48.34	1.9217	9 53 38.0	8.414
9	13 27 43.69	1.9232	10 2 1.6	8.372
10	13 29 39.12	1.9246	10 10 22.7	8.330
11	13 31 34.64	1.9261	10 18 41.2	8.286
12	13 33 30.26	1.9277	10 26 57.1	8.242
13	13 35 25.97	1.9292	10 35 10.3	8.198
14	13 37 21.77	1.9307	10 43 20.9	8.154
15	13 39 17.66	1.9323	10 51 28.8	8.108
16	13 41 13.65	1.9340	10 59 33.9	8.062
17	13 43 9.74	1.9357	11 7 36.2	8.015
18	13 45 5.93	1.9373	11 15 35.7	7.968
19	13 47 2.22	1.9390	11 23 32.4	7.921
20	13 48 58.61	1.9407	11 31 26.2	7.873
21	13 50 55.10	1.9423	11 39 17.1	7.824
22	13 52 51.69	1.9441	11 47 5.1	7.774
23	13 54 48.39	1.9459	S. 11 54 50.0	7.723

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 56 45.20	1.9477	S. 12 2 31.9	7.673
1	13 58 42.12	1.9495	12 10 10.8	7.622
2	14 0 39.14	1.9513	12 17 46.6	7.570
3	14 2 36.27	1.9531	12 25 19.2	7.517
4	14 4 33.51	1.9549	12 32 48.7	7.465
5	14 6 30.86	1.9568	12 40 15.0	7.412
6	14 8 28.33	1.9587	12 47 38.1	7.358
7	14 10 25.91	1.9606	12 54 58.0	7.304
8	14 12 23.60	1.9625	13 2 14.6	7.248
9	14 14 21.41	1.9644	13 9 27.8	7.192
10	14 16 19.33	1.9663	13 16 37.6	7.135
11	14 18 17.37	1.9682	13 23 44.0	7.078
12	14 20 15.52	1.9702	13 30 47.0	7.021
13	14 22 13.79	1.9722	13 37 46.6	6.964
14	14 24 12.18	1.9742	13 44 42.7	6.905
15	14 26 10.69	1.9762	13 51 35.2	6.846
16	14 28 9.32	1.9782	13 58 24.2	6.787
17	14 30 8.07	1.9802	14 5 9.6	6.727
18	14 32 6.94	1.9822	14 11 51.5	6.667
19	14 34 5.93	1 9842	14 18 29.7	6.606
20	14 36 5.04	1.9862	14 25 4.2	6.544
21	14 38 4.28	1.9883	14 31 35.0	6.482
22	14 40 3.64	1.9903	14 38 2.0	6.419
23	14 42 3.12	1.9923	14 44 25.2	6.356
24	14 44 2.72	1.9944	S. 14 50 44.7	6.293

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 44 2.72	1.9944	S. 14 50 44.7	6.293
1	14 46 2.45	1.9965	14 57 0.4	6.228
2	14 48 2.30	1.9985	15 3 12.1	6.163
3	14 50 2.27	2.0006	15 9 19.9	6.098
4	14 52 2.37	2.0027	15 15 23.8	6.032
5	14 54 2.59	2.0047	15 21 23.7	5.965
6	14 56 2.94	2.0068	15 27 19.6	5.898
7	14 58 3.41	2.0089	15 33 11.5	5.831
8	15 0 4.01	2.0110	15 38 59.3	5.763
9	15 2 4.73	2.0131	15 44 43.0	5.694
10	15 4 5.58	2.0152	15 50 22.6	5.626
11	15 6 6.55	2.0172	15 55 58.1	5.557
12	15 8 7.65	2.0193	16 1 29.4	5.487
13	15 10 8.87	2.0214	16 6 56.5	5.416
14	15 12 10.22	2.0235	16 12 19.3	5.345
15	15 14 11.69	2.0256	16 17 37.9	5.274
16	15 16 13.29	2.0277	16 22 52.2	5.202
17	15 18 15.01	2.0297	16 28 2.1	5.129
18	15 20 16.85	2.0317	16 33 7.7	5.056
19	15 22 18.82	2.0338	16 38 8.9	4.983
20	15 24 20.91	2.0358	16 43 5.7	4.910
21	15 26 23.12	2.0378	16 47 58.1	4.837
22	15 28 25.45	2.0398	16 52 46.1	4.762
23	15 30 27.90	2.0419	S. 16 57 29.5	4.686

THURSDAY, NOVEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 32 30.48	2.0440	S. 17 2 8.4	4.610

PHASES OF THE MOON.

	d	h	m
☽ First Quarter . . .	8	22	19.6
○ Full Moon	15	18	45.5
☾ Last Quarter. . . .	22	11	18.6
● New Moon	30	11	56.9

	d	h
☾ Apogee.	3	6.0
☾ Perigee.	16	4.6
☾ Apogee.	30	9.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
2	Sun	W.	13° 41′ 20″	3487	15° 1′ 59″	3480	16° 22′ 45″	3476	17° 43′ 36″	3473
	Antares	E.	45 37 14	3137	44 9 49	3143	42 42 32	3151	41 15 24	3158
	α Aquilæ	E.	97 0 20	3459	95 39 10	3459	94 18 0	3460	92 56 51	3461
3	Sun	W.	24 28 17	3470	25 49 15	3469	27 10 14	3468	28 31 14	3468
	Antares	E.	34 2 13	3205	32 36 10	3218	31 10 22	3231	29 44 50	3247
	α Aquilæ	E.	86 11 35	3472	84 50 40	3475	83 29 48	3479	82 9 0	3481
4	Sun	W.	35 16 22	3463	36 37 27	3462	37 58 33	3460	39 19 42	3458
	α Aquilæ	E.	75 26 3	3504	74 5 43	3509	72 45 29	3515	71 25 22	3521
	Fomalhaut	E.	105 25 31	3564	104 6 17	3556	102 46 55	3550	101 27 26	3544
5	Sun	W.	46 6 8	3443	47 27 36	3439	48 49 8	3435	50 10 45	3430
	α Aquilæ	E.	64 46 37	3560	63 27 19	3569	62 8 11	3580	60 49 15	3591
	Fomalhaut	E.	94 48 21	3515	93 28 14	3511	92 8 2	3506	90 47 45	3502
6	Sun	W.	57 0 20	3401	58 22 35	3393	59 44 59	3386	61 7 31	3378
	α Aquilæ	E.	54 18 1	3665	53 0 37	3685	51 43 34	3707	50 26 54	3730
	Fomalhaut	E.	84 5 10	3482	82 44 26	3479	81 23 39	3477	80 2 49	3473
	α Pegasi	E.	100 14 23	3199	98 48 13	3192	97 21 54	3183	95 55 25	3176
7	Sun	W.	68 2 38	3332	69 26 12	3322	70 49 58	3312	72 13 56	3300
	α Aquilæ	E.	44 10 46	3895	42 57 21	3941	41 44 43	3992	40 32 56	4049
	Fomalhaut	E.	73 17 55	3464	71 56 51	3463	70 35 46	3462	69 14 40	3463
	α Pegasi	E.	88 40 34	3133	87 13 4	3124	85 45 23	3114	84 17 31	3105
8	Sun	W.	79 17 17	3236	80 42 43	3223	82 8 25	3209	83 34 24	3194
	Antares	W.	27 32 8	3052	29 1 16	3023	30 31 0	2996	32 1 18	2970
	Fomalhaut	E.	62 29 33	3476	61 8 42	3481	59 47 57	3488	58 27 19	3497
	α Pegasi	E.	76 55 15	3056	75 26 11	3046	73 56 55	3035	72 27 26	3025
9	Sun	W.	90 48 52	3114	92 16 44	3097	93 44 57	3080	95 13 31	3062
	Antares	W.	39 40 29	2855	41 13 46	2834	42 47 30	2813	44 21 41	2792
	Fomalhaut	E.	51 47 11	3568	50 28 2	3590	49 9 17	3616	47 51 0	3646
	α Pegasi	E.	64 56 49	2973	63 26 3	2964	61 55 5	2955	60 23 56	2946
	α Arietis	E.	108 4 0	2839	106 30 23	2822	104 56 24	2804	103 22 2	2788
10	Sun	W.	102 41 56	2969	104 12 47	2950	105 44 2	2931	107 15 42	2910
	Antares	W.	52 19 26	2689	53 56 21	2669	55 33 43	2649	57 11 32	2628
	Fomalhaut	E.	41 29 26	3883	40 15 49	3953	39 3 23	4036	37 52 19	4131
	α Pegasi	E.	52 45 32	2909	51 13 25	2905	49 41 12	2901	48 8 55	2900
	α Arietis	E.	95 24 31	2699	93 47 50	2680	92 10 44	2662	90 33 13	2644
11	Sun	W.	115 0 27	2810	116 34 42	2789	118 9 24	2769	119 44 38	2748
	Antares	W.	65 27 34	2527	67 8 10	2507	68 49 14	2487	70 30 46	2467
	α Arietis	E.	82 19 27	2552	80 39 26	2534	78 59 0	2516	77 18 9	2497
	Aldebaran	E.	115 32 10	2485	113 50 36	2466	112 8 35	2447	110 26 7	2428
12	Antares	W.	79 5 27	2369	80 49 46	2350	82 34 33	2331	84 19 47	2313
	α Aquilæ	W.	35 7 37	3773	36 23 7	3637	37 41 1	3516	39 1 7	3407
	α Arietis	E.	68 47 38	2411	67 4 19	2394	65 20 36	2378	63 36 30	2363
	Aldebaran	E.	101 46 59	2333	100 1 48	2315	98 16 10	2296	96 30 4	2277
	Saturn	E.	103 7 45	2319	101 22 14	2300	99 36 15	2282	97 49 49	2264

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
2	Sun	W.	19° 4′ 30″	3471	20° 25′ 26″	3471	21° 46′ 23″	3471	23° 7′ 20″	3471
	Antares	E.	39 48 25	3167	38 21 36	3175	36 54 57	3184	35 28 29	3194
	α Aquilæ	E.	91 35 43	3463	90 14 37	3465	88 53 34	3467	87 32 33	3470
3	Sun	W.	29 52 14	3467	31 13 15	3467	32 34 16	3466	33 55 18	3464
	Antares	E.	28 19 36	3264	26 54 42	3284	25 30 12	3307	24 6 9	3335
	α Aquilæ	E.	80 48 15	3486	79 27 35	3489	78 6 59	3494	76 46 28	3499
4	Sun	W.	40 40 53	3455	42 2 7	3453	43 23 24	3450	44 44 44	3446
	α Aquilæ	E.	70 5 21	3528	68 45 28	3534	67 25 42	3543	66 6 5	3551
	Fomalhaut	E.	100 7 50	3538	98 48 8	3532	97 28 19	3525	96 8 23	3520
5	Sun	W.	51 32 28	3424	52 54 17	3419	54 16 12	3414	55 38 13	3408
	α Aquilæ	E.	59 30 31	3603	58 12 0	3617	56 53 44	3632	55 35 44	3648
	Fomalhaut	E.	89 27 23	3497	88 6 56	3494	86 46 25	3490	85 25 50	3486
6	Sun	W.	62 30 13	3370	63 53 4	3361	65 16 5	3352	66 39 16	3343
	α Aquilæ	E.	49 10 39	3757	47 54 52	3786	46 39 35	3819	45 24 52	3855
	Fomalhaut	E.	78 41 55	3471	77 20 58	3469	75 59 59	3467	74 38 58	3465
	α Pegasi	E.	94 28 47	3167	93 1 59	3159	91 35 1	3151	90 7 53	3142
7	Sun	W.	73 38 8	3288	75 2 33	3276	76 27 13	3264	77 52 7	3250
	α Aquilæ	E.	39 22 5	4114	38 12 17	4188	37 3 40	4273	35 56 22	4370
	Fomalhaut	E.	67 53 35	3464	66 32 31	3466	65 11 29	3468	63 50 29	3471
	α Pegasi	E.	82 49 28	3096	81 21 13	3086	79 52 46	3076	78 24 7	3065
8	Sun	W.	85 0 40	3178	86 27 15	3163	87 54 8	3148	89 21 20	3131
	Antares	W.	33 32 8	2946	35 3 29	2922	36 35 20	2899	38 7 40	2876
	Fomalhaut	E.	57 6 51	3506	55 46 34	3518	54 26 30	3532	53 6 41	3549
	α Pegasi	E.	70 57 44	3014	69 27 49	3005	67 57 42	2994	66 27 22	2984
9	Sun	W.	96 42 27	3044	98 11 45	3026	99 41 25	3007	101 11 29	2989
	Antares	W.	45 56 20	2771	47 31 26	2750	49 6 59	2730	50 42 59	2710
	Fomalhaut	E.	46 33 15	3681	45 16 8	3721	43 59 43	3768	42 44 7	3822
	α Pegasi	E.	58 52 36	2938	57 21 5	2929	55 49 23	2922	54 17 32	2915
	α Arietis	E.	101 47 18	2770	100 12 11	2753	98 36 41	2735	97 0 48	2717
10	Sun	W.	108 47 48	2690	110 20 19	2670	111 53 16	2651	113 26 38	2630
	Antares	W.	58 49 49	2607	60 28 34	2587	62 7 46	2567	63 47 26	2547
	Fomalhaut	E.	36 42 47	4241	35 35 0	4370	34 29 12	4520	33 25 38	4696
	α Pegasi	E.	46 36 36	2900	45 4 17	2901	43 32 0	2905	41 59 48	2913
	α Arietis	E.	88 55 18	2626	87 16 58	2607	85 38 13	2589	83 59 3	2570
11	Sun	W.	121 20 9	2728	122 56 12	2707	124 32 42	2687	126 9 39	2666
	Antares	W.	72 12 46	2446	73 55 15	2426	75 38 12	2407	77 21 36	2389
	α Arietis	E.	75 36 52	2479	73 55 10	2462	72 13 4	2445	70 30 33	2428
	Aldcbaran	E.	108 43 12	2409	106 59 50	2389	105 16 0	2371	103 31 43	2352
12	Antares	W.	86 5 27	2295	87 51 34	2277	89 38 7	2260	91 25 6	2243
	α Aquilæ	W.	40 23 16	3308	41 47 18	3219	43 13 5	3138	44 40 29	3064
	α Arietis	E.	61 52 2	2348	60 7 12	2334	58 22 2	2320	56 36 32	2308
	Aldebaran	E.	94 43 31	2260	92 56 32	2243	91 9 8	2225	89 21 18	2208
	Saturn	E.	96 2 57	2246	94 15 38	2229	92 27 53	2211	90 39 42	2194

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	Antares	W.	93° 12′ 30″	2226	95° 0′ 18″	2210	96° 48′ 30″	2194	98° 37′ 6″	2180
	α Aquilæ	W.	46 9 23	2996	47 39 41	2935	49 11 16	2877	50 44 4	2825
	α Arietis	E.	54 50 44	2296	53 4 38	2285	51 18 16	2274	49 31 39	2266
	Aldebaran	E.	87 33 2	2191	85 44 21	2175	83 55 16	2159	82 5 47	2143
	Saturn	E.	88 51 5	2177	87 2 3	2161	85 12 36	2145	83 22 46	2130
14	α Aquilæ	W.	58 43 28	2618	60 21 58	2586	62 1 12	2557	63 41 6	2530
	α Arietis	E.	40 36 5	2246	38 48 46	2249	37 1 32	2255	35 14 26	2264
	Aldebaran	E.	72 52 45	2075	71 1 7	2062	69 9 10	2051	67 16 55	2041
	Saturn	E.	74 7 57	2060	72 15 56	2048	70 23 37	2037	68 31 0	2026
15	α Aquilæ	W.	72 9 5	2426	73 52 3	2411	75 35 22	2398	77 19 0	2387
	Fomalhaut	W.	44 9 11	3019	45 39 0	2948	47 10 18	2884	48 42 57	2828
	α Pegasi	W.	25 23 11	3062	26 52 7	2922	28 23 58	2808	29 58 16	2711
	Aldebaran	E.	57 51 52	1997	55 58 13	1990	54 4 23	1985	52 10 25	1980
	Saturn	E.	59 4 0	1982	57 9 57	1975	55 15 43	1969	53 21 20	1964
	Pollux	E.	100 35 15	2088	98 43 58	2081	96 52 30	2074	95 0 51	2069
	Mars	E.	109 42 37	2172	107 53 27	2164	106 4 6	2157	104 14 34	2152
	Jupiter	E.	111 41 3	2047	109 48 42	2039	107 56 9	2033	106 3 26	2028
16	Fomalhaut	W.	56 42 10	2626	58 20 29	2599	59 59 25	2576	61 38 53	2555
	α Pegasi	W.	38 15 54	2417	39 59 4	2381	41 43 6	2351	43 27 51	2326
	Aldebaran	E.	42 39 11	1969	40 44 48	1970	38 50 26	1971	36 56 6	1973
	Saturn	E.	43 47 51	1951	41 52 59	1951	39 58 7	1951	38 3 16	1953
	Pollux	E.	85 40 58	2055	83 48 50	2056	81 56 43	2058	80 4 39	2060
	Mars	E.	95 5 12	2136	93 15 8	2136	91 25 4	2136	89 35 0	2137
	Jupiter	E.	96 38 9	2012	94 44 54	2012	92 51 39	2012	90 58 24	2014
17	Fomalhaut	W.	70 1 59	2494	71 43 20	2489	73 24 48	2487	75 6 20	2486
	α Pegasi	W.	52 18 56	2253	54 6 5	2246	55 53 24	2241	57 40 50	2239
	Pollux	E.	70 45 48	2088	68 54 31	2097	67 3 28	2107	65 12 40	2118
	Mars	E.	80 25 39	2158	78 36 8	2164	76 46 47	2172	74 57 37	2180
	Jupiter	E.	81 33 6	2033	79 40 23	2039	77 47 49	2046	75 55 27	2054
	Regulus	E.	107 7 37	2001	105 14 4	2007	103 20 40	2014	101 27 27	2021
18	Fomalhaut	W.	83 33 32	2507	85 14 36	2515	86 55 28	2526	88 36 5	2538
	α Pegasi	W.	66 38 7	2250	68 25 20	2256	70 12 24	2264	71 59 17	2272
	Pollux	E.	56 3 26	2190	54 14 44	2209	52 26 30	2229	50 38 45	2250
	Mars	E.	65 55 15	2233	64 7 37	2245	62 20 17	2259	60 33 17	2274
	Jupiter	E.	66 37 2	2104	64 46 9	2116	62 55 35	2130	61 5 21	2143
	Regulus	E.	92 4 33	2068	90 12 44	2079	88 21 12	2091	86 29 59	2104
19	Fomalhaut	W.	96 54 28	2617	98 33 0	2637	100 11 5	2657	101 48 42	2680
	α Pegasi	W.	80 50 2	2329	82 35 19	2343	84 20 16	2357	86 4 52	2373
	α Arietis	W.	37 12 33	2345	38 57 27	2346	40 42 19	2349	42 27 7	2354
	Pollux	E.	41 48 37	2382	40 4 36	2414	38 21 22	2450	36 38 59	2490
	Mars	E.	51 43 54	2355	49 59 14	2373	48 15 1	2392	46 31 15	2412
	Jupiter	E.	51 59 36	2220	50 11 38	2237	48 24 6	2255	46 37 0	2273
	Regulus	E.	77 19 2	2175	75 29 57	2190	73 41 15	2206	71 52 57	2222
	Sun	E.	134 43 32	2461	133 1 24	2477	131 19 39	2494	129 38 18	2512
20	α Pegasi	W.	94 42 4	2457	96 24 17	2477	98 6 3	2495	99 47 23	2514
	α Arietis	W.	51 8 35	2400	52 52 10	2412	54 35 27	2425	56 18 26	2438

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
13	Antares	W.	100° 26′ 4″	2165	102° 15′ 24″	2151	104° 5′ 5″	2138	105° 55′ 6″	2125
	α Aquilæ	W.	52 17 59	2777	53 52 57	2732	55 28 54	2692	57 5 45	2653
	α Arietis	E.	47 44 49	2258	45 57 48	2253	44 10 39	2249	42 23 24	2246
	Aldebaran	E.	80 15 54	2129	78 25 39	2114	76 35 2	2101	74 44 4	2087
	SATURN	E.	81 32 33	2115	79 41 57	2100	77 50 58	2086	75 59 38	2073
14	α Aquilæ	W.	65 21 38	2504	67 2 45	2482	68 44 23	2461	70 26 31	2442
	α Arietis	E.	33 27 34	2278	31 41 2	2296	29 54 57	2322	28 9 29	2355
	Aldebaran	E.	65 24 24	2030	63 31 37	2021	61 38 35	2012	59 45 20	2004
	SATURN	E.	66 38 6	2015	64 44 56	2006	62 51 31	1997	60 57 52	1989
15	α Aquilæ	W.	79 2 54	2377	80 47 2	2369	82 31 21	2363	84 15 49	2358
	Fomalhaut	W.	50 16 49	2778	51 51 46	2732	53 27 43	2692	55 4 33	2657
	α Pegasi	W.	31 34 41	2631	33 12 54	2564	34 52 39	2507	36 33 43	2459
	Aldebaran	E.	50 16 20	1977	48 22 9	1973	46 27 53	1971	44 33 33	1970
	SATURN	E.	51 26 49	1960	49 32 11	1956	47 37 28	1954	45 42 41	1952
	Pollux	E.	93 9 4	2064	91 17 9	2060	89 25 9	2058	87 33 5	2056
	MARS	E.	102 24 54	2147	100 35 6	2143	98 45 12	2140	96 55 14	2137
	JUPITER	E.	104 10 35	2023	102 17 36	2019	100 24 31	2016	98 31 22	2014
16	Fomalhaut	W.	63 18 50	2538	64 59 11	2524	66 39 51	2512	68 20 48	2502
	α Pegasi	W.	45 13 12	2305	46 59 4	2286	48 45 21	2273	50 32 0	2262
	Aldebaran	E.	35 1 49	1976	33 7 37	1980	31 13 32	1986	29 19 36	1993
	SATURN	E.	36 8 28	1956	34 13 44	1959	32 19 5	1963	30 24 32	1968
	Pollux	E.	78 12 39	2064	76 20 44	2068	74 28 56	2074	72 37 17	2081
	MARS	E.	87 44 58	2139	85 54 59	2143	84 5 5	2147	82 15 18	2153
	JUPITER	E.	89 5 11	2016	87 12 2	2019	85 18 57	2023	83 25 58	2027
17	Fomalhaut	W.	76 47 53	2487	78 29 25	2489	80 10 54	2493	81 52 17	2499
	α Pegasi	W.	59 28 20	2238	61 15 51	2239	63 3 20	2241	64 50 46	2245
	Pollux	E.	63 22 9	2130	61 31 56	2144	59 42 4	2158	57 52 33	2174
	MARS	E.	73 8 39	2189	71 19 55	2198	69 31 25	2209	67 43 11	2221
	JUPITER	E.	74 3 17	2062	72 11 20	2072	70 19 38	2083	68 28 12	2093
	Regulus	E.	99 34 25	2029	97 41 36	2037	95 49 0	2047	93 56 39	2057
18	Fomalhaut	W.	90 16 26	2551	91 56 29	2566	93 36 11	2582	95 15 31	2599
	α Pegasi	W.	73 45 57	2282	75 32 23	2293	77 18 33	2304	79 4 26	2316
	Pollux	E.	48 51 32	2272	47 4 52	2297	45 18 48	2323	43 33 22	2351
	MARS	E.	58 46 39	2289	57 0 23	2304	55 14 29	2320	53 28 59	2337
	JUPITER	E.	59 15 28	2157	57 25 56	2172	55 36 46	2187	53 47 59	2203
	Regulus	E.	84 39 6	2117	82 48 33	2131	80 58 21	2145	79 8 30	2160
19	Fomalhaut	W.	103 25 48	2704	105 2 23	2728	106 38 25	2754	108 13 53	2782
	α Pegasi	W.	87 49 5	2389	89 32 55	2405	91 16 22	2422	92 59 25	2439
	α Arietis	W.	44 11 48	2361	45 56 19	2369	47 40 38	2378	49 24 44	2389
	Pollux	E.	34 57 32	2533	33 17 5	2582	31 37 45	2635	29 59 38	2695
	MARS	E.	44 47 57	2432	43 5 8	2453	41 22 49	2474	39 41 0	2497
	JUPITER	E.	44 50 21	2292	43 4 10	2311	41 18 27	2331	39 33 13	2353
	Regulus	E.	70 5 3	2239	68 17 34	2257	66 30 31	2274	64 43 54	2291
	SUN	E.	127 57 21	2529	126 16 48	2546	124 36 39	2564	122 56 55	2582
20	α Pegasi	W.	101 28 16	2535	103 8 42	2555	104 48 39	2575	106 28 8	2596
	α Arietis	W.	58 1 6	2453	59 43 26	2467	61 25 26	2481	63 7 6	2496

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
20	Aldebaran	W.	17° 10′ 54″	2325	18° 56′ 17″	2336	20° 41′ 24″	2348	22° 26′ 13″	2360
	JUPITER	E.	37 48 30	2374	36 4 18	2397	34 20 39	2420	32 37 33	2444
	MARS	E.	37 59 43	2521	36 18 59	2546	34 38 50	2572	32 59 16	2599
	Regulus	E.	62 57 42	2309	61 11 56	2328	59 26 37	2346	57 41 44	2364
	SUN	E.	121 17 36	2601	119 38 43	2620	118 0 15	2638	116 22 12	2657
21	α Arietis	W.	64 48 25	2512	66 29 22	2527	68 9 57	2543	69 50 11	2558
	Aldebaran	W.	31 5 1	2440	32 47 38	2457	34 29 52	2473	36 11 43	2489
	SATURN	W.	30 4 16	2415	31 47 29	2432	33 30 18	2449	35 12 43	2467
	Regulus	E.	49 4 6	2460	47 21 56	2479	45 40 13	2499	43 58 58	2519
	SUN	E.	108 18 21	2753	106 42 51	2772	105 7 46	2791	103 33 6	2810
22	α Arietis	W.	78 5 52	2638	79 43 55	2654	81 21 36	2670	82 58 56	2686
	Aldebaran	W.	44 35 8	2572	46 14 41	2589	47 53 51	2605	49 32 39	2621
	SATURN	W.	43 38 47	2551	45 18 50	2567	46 58 30	2583	48 37 48	2600
	Regulus	E.	35 39 43	2621	34 1 17	2643	32 23 21	2666	30 45 55	2689
	SUN	E.	95 45 52	2902	94 13 36	2920	92 41 43	2938	91 10 12	2956
23	α Arietis	W.	91 0 24	2763	92 35 41	2777	94 10 39	2792	95 45 17	2807
	Aldebaran	W.	57 41 19	2698	59 18 2	2712	60 54 26	2726	62 30 31	2741
	SATURN	W.	56 48 54	2676	58 26 6	2691	60 2 58	2705	61 39 31	2719
	SUN	E.	83 38 5	3040	82 8 42	3056	80 39 38	3072	79 10 54	3087
24	Aldebaran	W.	70 26 25	2806	72 0 45	2818	73 34 49	2630	75 8 38	2842
	SATURN	W.	69 37 48	2785	71 12 36	2797	72 47 8	2808	74 21 25	2820
	Pollux	W.	29 42 55	3195	31 9 10	3172	32 35 52	3155	34 2 55	3142
	SUN	E.	71 51 46	3158	70 24 47	3172	68 58 5	3185	67 31 38	3198
25	Aldebaran	W.	82 54 4	2895	84 26 30	2905	85 58 43	2914	87 30 44	2923
	SATURN	W.	82 9 15	2873	83 42 9	2882	85 14 51	2891	86 47 21	2901
	Pollux	W.	41 21 18	3106	42 49 20	3104	44 17 25	3103	45 45 31	3102
	JUPITER	W.	28 28 32	3009	29 58 33	3011	31 28 32	3013	32 58 28	3017
	MARS	W.	26 43 4	3203	28 9 10	3200	29 35 19	3198	31 1 30	3198
	SUN	E.	60 23 1	3256	58 57 58	3266	57 33 7	3276	56 8 28	3287
26	Aldebaran	W.	95 8 6	2964	96 39 4	2970	98 9 54	2977	99 40 35	2985
	SATURN	W.	94 27 8	2941	95 58 35	2947	97 29 54	2954	99 1 4	2961
	Pollux	W.	53 6 3	3106	54 34 5	3108	56 2 5	3109	57 30 3	3112
	JUPITER	W.	40 27 0	3037	41 56 27	3042	43 25 48	3046	44 55 4	3050
	MARS	W.	38 12 11	3207	39 38 12	3209	41 4 10	3213	42 30 4	3216
	SUN	E.	49 7 59	3331	47 44 24	3338	46 20 57	3346	44 57 39	3353
27	Pollux	W.	64 49 11	3124	66 16 52	3126	67 44 30	3128	69 12 5	3131
	JUPITER	W	52 20 6	3070	53 48 52	3074	55 17 33	3078	56 46 10	3082
	MARS	W.	49 38 36	3232	51 4 7	3235	52 29 35	3238	53 54 59	3241
	Regulus	W.	27 48 35	3090	29 16 57	3088	30 45 21	3087	32 13 47	3086
	SUN	E.	38 3 7	3386	36 40 34	3391	35 18 7	3396	33 55 46	3401
28	Pollux	W.	76 29 17	3142	77 56 36	3144	79 23 52	3146	80 51 6	3148
	JUPITER	W.	64 8 15	3096	65 36 29	3098	67 4 41	3100	68 32 50	3103
	MARS	W.	61 1 11	3253	62 26 17	3256	63 51 20	3258	65 16 21	3259
	Regulus	W.	39 36 3	3066	41 4 30	3067	42 32 55	3068	44 1 19	3069
	SUN	E.	27 5 22	3422	25 43 31	3426	24 21 44	3430	23 0 1	3432

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
20	Aldebaran	W.	24° 10′ 42″	2377	25° 54′ 50″	2391	27° 38′ 37″	2407	29° 22′ 1″	2424
	JUPITER	E.	30 55 1	2470	29 13 5	2497	27 31 48	2527	25 51 12	2558
	MARS	E.	31 20 20	2628	29 42 3	2658	28 4 27	2692	26 27 36	2727
	Regulus	E.	55 57 18	2383	54 13 19	2402	52 29 47	2421	50 46 43	2440
	SUN	E.	114 44 35	2676	113 7 23	2695	111 30 37	2714	109 54 16	2734
21	α Arietis	W.	71 30 3	2574	73 9 33	2590	74 48 41	2607	76 27 27	2622
	Aldebaran	W.	37 53 11	2507	39 34 15	2523	41 14 56	2540	42 55 13	2556
	SATURN	W.	36 54 43	2484	38 36 19	2500	40 17 32	2517	41 58 21	2534
	Regulus	E.	42 18 11	2539	40 37 52	2559	38 58 1	2580	37 18 38	2600
	SUN	E.	101 58 51	2828	100 25 0	2848	98 51 34	2866	97 18 31	2884
22	α Arietis	W.	84 35 55	2701	86 12 33	2717	87 48 50	2732	89 24 47	2747
	Aldebaran	W.	51 11 5	2637	52 49 10	2653	54 26 53	2668	56 4 16	2683
	SATURN	W.	50 16 43	2615	51 55 17	2631	53 33 30	2646	55 11 22	2661
	Regulus	E.	29 9 0	2713	27 32 37	2738	25 56 47	2765	24 21 33	2794
	SUN	E.	89 39 4	2973	88 8 17	2990	86 37 52	3007	85 7 48	3024
23	α Arietis	W.	97 19 36	2821	98 53 36	2835	100 27 18	2849	102 0 42	2863
	Aldebaran	W.	64 6 17	2754	65 41 45	2767	67 16 56	2781	68 51 49	2794
	SATURN	W.	63 15 46	2732	64 51 43	2746	66 27 22	2759	68 2 44	2772
	SUN	E.	77 42 29	3102	76 14 22	3117	74 46 33	3131	73 19 1	3145
24	Aldebaran	W.	76 42 11	2853	78 15 30	2864	79 48 35	2875	81 21 26	2885
	SATURN	W.	75 55 27	2831	77 29 15	2842	79 2 48	2852	80 36 8	2862
	Pollux	W.	35 30 14	3130	36 57 47	3122	38 25 30	3115	39 53 21	3110
	SUN	E.	66 5 27	3210	64 39 29	3222	63 13 46	3234	61 48 17	3245
25	Aldebaran	W.	89 2 34	2931	90 34 13	2940	92 5 41	2949	93 36 58	2956
	SATURN	W.	88 19 39	2909	89 51 47	2917	91 23 44	2925	92 55 31	2933
	Pollux	W.	47 13 38	3101	48 41 46	3102	50 9 53	3103	51 37 59	3105
	JUPITER	W.	34 28 20	3021	35 58 7	3024	37 27 50	3028	38 57 28	3033
	MARS	W.	32 27 41	3199	33 53 51	3200	35 20 0	3202	36 46 7	3204
	SUN	E.	54 44 1	3296	53 19 45	3305	51 55 39	3314	50 31 44	3323
26	Aldebaran	W.	101 11 7	2991	102 41 31	2997	104 11 48	3003	105 41 57	3008
	SATURN	W.	100 32 6	2967	102 3 0	2973	103 33 46	2979	105 4 25	2984
	Pollux	W.	58 57 58	3114	60 25 50	3116	61 53 40	3119	63 21 27	3121
	JUPITER	W.	46 24 15	3054	47 53 21	3059	49 22 21	3063	50 51 16	3067
	MARS	W.	43 55 54	3219	45 21 40	3223	46 47 22	3225	48 13 1	3229
	SUN	E.	43 34 29	3360	42 11 27	3367	40 48 33	3373	39 25 46	3380
27	Pollux	W.	70 39 37	3133	72 7 6	3136	73 34 32	3138	75 1 56	3140
	JUPITER	W.	58 14 42	3084	59 43 11	3087	61 11 36	3091	62 39 57	3093
	MARS	W.	55 20 20	3244	56 45 37	3247	58 10 51	3249	59 36 2	3251
	Regulus	W.	33 42 14	3086	35 10 41	3085	36 39 9	3086	38 7 36	3086
	SUN	E.	32 33 31	3407	31 11 22	3411	29 49 18	3415	28 27 18	3418
28	Pollux	W.	82 18 17	3150	83 45 26	3152	85 12 33	3153	86 39 38	3155
	JUPITER	W.	70 0 56	3105	71 29 0	3107	72 57 1	3109	74 25 0	3109
	MARS	W.	66 41 20	3261	68 6 17	3263	69 31 12	3264	70 56 5	3266
	Regulus	W.	45 29 42	3090	46 58 4	3090	48 26 26	3091	49 54 47	3091
	SUN	E.	21 38 21	3435	20 16 44	3438	18 55 11	3441	17 33 41	3443

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	14 25 22.69	9.798	S. 14 25 6.3	−48.16	16 9.74	66.93	16 18.09	0.058
Frid.	2	14 29 18.25	9.832	14 44 15.2	47.58	16 9.99	67.04	16 19.09	0.025
Sat.	3	14 33 14.60	9.865	15 3 9.8	46.96	16 10.24	67.16	16 19.30	0.008
Sun.	4	14 37 11.76	9.899	15 21 49.6	−46.34	16 10.49	67.28	16 18.70	0.042
Mon.	5	14 41 9.73	9.933	15 40 14.1	45.69	16 10.74	67.40	16 17.29	0.076
Tues.	6	14 45 8.51	9.967	15 58 23.1	45.04	16 10.98	67.51	16 15.06	0.110
Wed.	7	14 49 8.10	10.001	16 16 16.0	−44.36	16 11.22	67.63	16 12.03	0.144
Thur.	8	14 53 8.52	10.035	16 33 52.5	43.67	16 11.46	67.75	16 8.18	0.178
Frid.	9	14 57 9.76	10.069	16 51 12.2	42.97	16 11.69	67.87	16 3.50	0.212
Sat.	10	15 1 11.84	10.104	17 8 14.6	−42.24	16 11.92	67.99	15 57.99	0.247
Sun.	11	15 5 14.75	10.139	17 24 59.4	41.49	16 12.15	68.11	15 51.66	0.282
Mon.	12	15 9 18.50	10.174	17 41 26.1	40.73	16 12.37	68.23	15 44.48	0.316
Tues.	13	15 13 23.10	10.209	17 57 34.5	−39.95	16 12.59	68.35	15 36.46	0.351
Wed.	14	15 17 28.54	10.244	18 13 24.1	39.16	16 12.81	68.47	15 27.60	0.386
Thur.	15	15 21 34.82	10.279	18 28 54.5	38.36	16 13.03	68.59	15 17.91	0.421
Frid.	16	15 25 41.94	10.314	18 44 5.3	−37.54	16 13.24	68.71	15 7.37	0.456
Sat.	17	15 29 49.92	10.349	18 58 56.2	36.70	16 13.44	68.83	14 55.97	0.491
Sun.	18	15 33 58.75	10.385	19 13 26.8	35.85	16 13.64	68.94	14 43.73	0.527
Mon.	19	15 38 8.42	10.420	19 27 36.7	−34.97	16 13.84	69.06	14 30.66	0.562
Tues.	20	15 42 18.93	10.456	19 41 25.5	34.08	16 14.03	69.18	14 16.74	0.598
Wed.	21	15 46 30.29	10.490	19 54 52.9	33.19	16 14.21	69.29	14 1.98	0.632
Thur.	22	15 50 42.47	10.524	20 7 58.5	−32.27	16 14.39	69.40	13 46.40	0.666
Frid.	23	15 54 55.46	10.557	20 20 42.0	31.33	16 14.57	69.51	13 30.01	0.699
Sat.	24	15 59 9.25	10.590	20 33 3.1	30.39	16 14.75	69.61	13 12.82	0.732
Sun.	25	16 3 23.83	10.623	20 45 1.2	−29.43	16 14.93	69.71	12 54.84	0.764
Mon.	26	16 7 39.19	10.655	20 56 36.1	28.45	16 15.10	69.81	12 36.08	0.796
Tues.	27	16 11 55.30	10.687	21 7 47.5	27.46	16 15.28	69.91	12 16.58	0.828
Wed.	28	16 16 12.14	10.717	21 18 35.0	−26.46	16 15.44	70.01	11 56.35	0.858
Thur.	29	16 20 29.70	10.746	21 28 58.3	25.45	16 15.60	70.10	11 35.41	0.887
Frid.	30	16 24 47.94	10.774	21 38 57.1	24.42	16 15.76	70.19	11 13.79	0.915
Sat.	31	16 29 6.86	10.801	S. 21 48 31.3	−23.38	16 15.91	70.28	10 51.49	0.942

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.19$ from the sidereal time.
The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	14 25 25.36	9.799	S. 14 25 19.4	-48.16	16 18.10	0.058	14 41 43.46
Frid.	2	14 29 20.92	9.832	14 44 28.2	47.57	16 19.09	0.025	14 45 40.01
Sat.	3	14 33 17.28	9.865	15 3 22.5	46.95	16 19.29	0.008	14 49 36.57
Sun.	4	14 37 14.45	9.899	15 22 2.1	-46.33	16 18.68	0.042	14 53 33.12
Mon.	5	14 41 12.42	9.933	15 40 26.4	45.68	16 17.26	0.076	14 57 29.68
Tues.	6	14 45 11.21	9.967	15 58 35.2	45.03	16 15.02	0.110	15 1 26.23
Wed.	7	14 49 10.80	10.001	16 16 27.9	-44.35	16 11.98	0.144	15 5 22.79
Thur.	8	14 53 11.22	10.035	16 34 4.2	43.66	16 8.12	0.178	15 9 19.34
Frid.	9	14 57 12.46	10.069	16 51 23.7	42.96	16 3.44	0.212	15 13 15.90
Sat.	10	15 1 14.53	10.104	17 8 25.9	-42.23	15 57.93	0.247	15 17 12.45
Sun.	11	15 5 17.43	10.139	17 25 10.4	41.48	15 51.58	0.282	15 21 9.01
Mon.	12	15 9 21.17	10.173	17 41 36.8	40.72	15 44.39	0.316	15 25 5.56
Tues.	13	15 13 25.75	10.208	17 57 44.9	-39.94	15 36.37	0.351	15 29 2.12
Wed.	14	15 17 31.17	10.243	18 13 34.2	39.15	15 27.50	0.386	15 32 58.67
Thur.	15	15 21 37.43	10.278	18 29 4.2	38.35	15 17.80	0.421	15 36 55.23
Frid.	16	15 25 44.54	10.313	18 44 14.8	-37.53	15 7.25	0.456	15 40 51.79
Sat.	17	15 29 52.50	10.348	18 59 5.4	36.69	14 55.85	0.491	15 44 48.35
Sun.	18	15 34 1.30	10.384	19 13 35.6	35.84	14 43.60	0.527	15 48 44.90
Mon.	19	15 38 10.94	10.419	19 27 45.2	-34.96	14 30.52	0.562	15 52 41.46
Tues.	20	15 42 21.42	10.455	19 41 33.6	34.07	14 16.59	0.598	15 56 38.01
Wed.	21	15 46 32.74	10.489	19 55 0.7	33.18	14 1.83	0.632	16 0 34.57
Thur.	22	15 50 44.88	10.523	20 8 6.0	-32.26	13 46.24	0.666	16 4 31.12
Frid.	23	15 54 57.83	10.556	20 20 49.2	31.32	13 29.85	0.699	16 8 27.68
Sat.	24	15 59 11.58	10.589	20 33 9.8	30.38	13 12.66	0.732	16 12 24.23
Sun.	25	16 3 26.11	10.621	20 45 7.5	-29.42	12 54.68	0.764	16 16 20.79
Mon.	26	16 7 41.42	10 653	20 56 42.1	28.44	12 35.92	0.796	16 20 17.34
Tues.	27	16 11 57.48	10.685	21 7 53.2	27.45	12 16.42	0.828	16 24 13.90
Wed.	28	16 16 14.27	10.715	21 18 40.3	-26.45	11 56.18	0.858	16 28 10.45
Thur.	29	16 20 31.77	10.744	21 29 3.3	25.44	11 35.24	0.887	16 32 7.01
Frid.	30	16 24 49.95	10.772	21 39 1.8	24.41	11 13.62	0.915	16 36 3.57
Sat.	31	16 29 8.81	10.799	S. 21 48 35.6	-23.37	10 51.32	0.942	16 40 0.13

Note—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, + $9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.								
		THE SUN'S						
Day of the Month.	Day of the Year.	TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	305	218 44 51.1	44 1.1	150.27	− 0.02	9.9965230	− 46.9	9 16 45.07
2	306	219 44 58.6	44 8.5	150.34	+ 0.09	9.9964107	46.7	9 12 49.17
3	307	220 45 7.8	44 17.6	150.41	0.19	9.9962988	46.5	9 8 53.27
4	308	221 45 18.5	44 28.2	150.48	+ 0.25	9.9961876	− 46.2	9 4 57.36
5	309	222 45 30.8	44 40.4	150.55	0.29	9.9960771	45.9	9 1 1.45
6	310	223 45 44.7	44 54.1	150.61	0.30	9.9959675	45.5	8 57 5.54
7	311	224 46 0.2	45 9.5	150.67	+ 0.27	9.9958590	− 45.0	8 53 9.63
8	312	225 46 17.1	45 26.3	150.73	0.22	9.9957517	44.4	8 49 13.72
9	313	226 46 35.4	45 44.5	150.79	0.14	9.9956457	43.8	8 45 17.81
10	314	227 46 55.1	46 4.0	150.85	+ 0.04	9.9955412	− 43.1	8 41 21.90
11	315	228 47 16.3	46 25.0	150.91	− 0.08	9.9954384	42.4	8 37 25.99
12	316	229 47 39.0	46 47.6	150.98	0.21	9.9953374	41.7	8 33 30.08
13	317	230 48 3.2	47 11.7	151.04	− 0.33	9.9952384	− 40.9	8 29 34.17
14	318	231 48 28.9	47 37.3	151.10	0.46	9.9951413	40.1	8 25 38.26
15	319	232 48 56.1	48 4.3	151.16	0.59	9.9950462	39.3	8 21 42.35
16	320	233 49 24.9	48 32.9	151.23	− 0.70	9.9949531	− 38.4	8 17 46.44
17	321	234 49 55.5	49 3.3	151.30	0.77	9.9948621	37.6	8 13 50.53
18	322	235 50 27.7	49 35.5	151.37	0.83	9.9947731	36.7	8 9 54.62
19	323	236 51 1.6	50 9.3	151.44	− 0.85	9.9946861	− 35.9	8 5 58.71
20	324	237 51 37.2	50 44.7	151.52	0.85	9.9946011	35.0	8 2 2.80
21	325	238 52 14.6	51 21.9	151.60	0.80	9.9945180	34.3	7 58 6.89
22	326	239 52 53.8	52 1.0	151.67	− 0.74	9.9944365	− 33.6	7 54 10.98
23	327	240 53 34.6	52 41.7	151.74	0.63	9.9943567	32.9	7 50 15.07
24	328	241 54 17.0	53 24.0	151.80	0.53	9.9942784	32.3	7 46 19.16
25	329	242 55 1.1	54 7.9	151.87	− 0.40	9.9942016	− 31.7	7 42 23.25
26	330	243 55 46.8	54 53.4	151.93	0.27	9.9941261	31.2	7 38 27.34
27	331	244 56 34.0	55 40.5	151.99	− 0.13	9.9940519	30.6	7 34 31.44
28	332	245 57 22.6	56 29.0	152.05	0.00	9.9939790	− 30.1	7 30 35.53
29	333	246 58 12.4	57 18.7	152.10	+ 0.12	9.9939073	29.6	7 26 39.62
30	334	247 59 3.4	58 9.4	152.15	0.22	9.9938368	29.1	7 22 43.71
31	335	248 59 55.5	59 1.3	152.20	+ 0.29	9.9937677	− 28.6	7 18 47.79

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January 0^{d}.0.

Diff. for 1 Hour,
— 9^{s}.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 45.4	14 46.7	54 2.6	+ 0.34	54 7.4	+ 0.46	0 52.4	1.94	1.5
2	14 48.4	14 50.5	54 13.7	0.58	54 21.4	0.71	1 39.6	1.99	2.5
3	14 53.1	14 56.1	54 30.8	0.84	54 41.7	0.97	2 27.9	2.03	3.5
4	14 59.5	15 3.4	54 54.3	+ 1.12	55 8.7	+ 1.27	3 16.9	2.05	4.5
5	15 7.8	15 12.8	55 24.9	1.42	55 43.0	1.57	4 6.2	2.05	5.5
6	15 18.2	15 24.0	56 2.8	1.72	56 24.4	1.87	4 55.5	2.05	6.5
7	15 30.4	15 37.1	56 47.7	+ 2.00	57 12.4	+ 2.11	5 44.8	2.06	7.5
8	15 44.2	15 51.5	57 38.3	2.20	58 5.2	2.27	6 34.3	2.08	8.5
9	15 58.9	16 6.4	58 32.6	2.29	58 59.9	2.26	7 24.5	2.11	9.5
10	16 13.7	16 20.6	59 26.7	+ 2.18	59 52.3	+ 2.06	8 16.0	2.18	10.5
11	16 27.1	16 32.8	60 16.0	1.87	60 37.1	1.62	9 9.4	2.28	11.5
12	16 37.7	16 41.5	60 55.0	1.32	61 8.9	0.97	10 5.3	2.39	12.5
13	16 44.1	16 45.3	61 18.4	+ 0.59	61 23.0	+ 0.17	11 3.9	2.50	13.5
14	16 45.2	16 43.7	61 22.5	- 0.24	61 17.0	- 0.67	12 4.8	2.57	14.5
15	16 40.8	16 36.7	61 6.5	1.07	60 51.4	1.42	13 6.8	2.58	15.5
16	16 31.5	16 25.3	60 32.2	- 1.75	60 9.5	- 2.01	14 8.0	2.51	16.5
17	16 18.4	16 10.9	59 44 0	2.21	59 16.5	2.34	15 6.8	2.38	17.5
18	16 3.1	15 55.1	58 47.8	2.42	58 18.5	2.44	16 2.1	2.22	18.5
19	15 47.1	15 39.3	57 49.2	- 2.42	57 20.5	- 2.35	16 53.7	2.07	19.5
20	15 31.8	15 24.7	56 52.9	2.24	56 26.7	2.11	17 41.9	1.94	20.5
21	15 18.0	15 12.0	56 2.4	1.94	55 40.1	1.77	18 27.4	1.85	21.5
22	15 6.5	15 1.6	55 20.0	- 1.58	55 2.1	- 1.39	19 11.1	1.79	22.5
23	14 57.4	14 53.8	54 46.6	1.19	54 33.4	1.01	19 53.9	1.77	23.5
24	14 50.8	14 48.4	54 22.4	0.82	54 13.7	0.64	20 36.5	1.78	24.5
25	14 46.7	14 45.4	54 7.1	- 0.47	54 2.5	- 0.31	21 19.7	1.82	25.5
26	14 44.7	14 44.4	53 59.8	- 0.15	53 58.9	- 0.01	22 3.9	1.87	26.5
27	14 44.6	14 45.2	53 59.6	+ 0.12	54 1.8	+ 0.23	22 49.5	1.93	27.5
28	14 46.2	14 47.5	54 5.4	+ 0.35	54 10.2	+ 0.45	23 36.5	1.99	28.5
29	14 49.1	14 51.1	54 16.2	0.55	54 23.4	0.64	δ		29.5
30	14 53.3	14 55.9	54 31.6	0.72	54 40.9	0.81	0 24.8	2.04	0.7
31	14 58.6	15 1.7	54 51.1	+ 0.89	55 2.3	+ 0.97	1 14.0	2.06	1.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.					**SATURDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 32 30.48	2.0440	S. 17 2 8.4	4.610	0	17 12 41.15	2.1230	S. 19 9 0.1	0.552
1	15 34 33.18	2.0460	17 6 42.7	4.534	1	17 14 48.56	2.1241	19 9 30.5	0.461
2	15 36 36.00	2.0480	17 11 12.5	4.458	2	17 16 56.04	2.1252	19 9 55.4	0.369
3	15 38 38.94	2.0500	17 15 37.7	4.382	3	17 19 3.59	2.1263	19 10 14.8	0.278
4	15 40 42.00	2.0520	17 19 58.3	4.304	4	17 21 11.20	2.1273	19 10 28.8	0.186
5	15 42 45.18	2.0539	17 24 14.2	4.226	5	17 23 18.87	2.1283	19 10 37.2	0.094
6	15 44 48.47	2.0558	17 28 25.4	4.147	6	17 25 26.60	2.1293	19 10 40.1	− 0.002
7	15 46 51.88	2.0578	17 32 31.9	4.069	7	17 27 34.39	2.1303	19 10 37.5	+ 0.090
8	15 48 55.41	2.0598	17 36 33.7	3.990	8	17 29 42.24	2.1313	19 10 29.3	0.182
9	15 50 59.06	2.0617	17 40 30.7	3.911	9	17 31 50.15	2.1322	19 10 15.6	0.274
10	15 53 2.82	2.0636	17 44 23.0	3.832	10	17 33 58.11	2.1332	19 9 56.4	0.367
11	15 55 6.69	2.0655	17 48 10.5	3.751	11	17 36 6.13	2.1341	19 9 31.6	0.459
12	15 57 10.68	2.0674	17 51 53.1	3.670	12	17 38 14.20	2.1349	19 9 1.3	0.552
13	15 59 14.78	2.0693	17 55 30.9	3.589	13	17 40 22.32	2.1357	19 8 25.4	0.645
14	16 1 18.99	2.0712	17 59 3.8	3.507	14	17 42 30.49	2.1365	19 7 43.9	0.737
15	16 3 23.32	2.0731	18 2 31.8	3.426	15	17 44 38.70	2.1373	19 6 56.9	0.830
16	16 5 27.76	2.0748	18 5 54.9	3.344	16	17 46 46.96	2.1381	19 6 4.3	0.923
17	16 7 32.30	2.0766	18 9 13.1	3.261	17	17 48 55.27	2.1388	19 5 6.2	1.016
18	16 9 36.95	2.0784	18 12 26.3	3.178	18	17 51 3.62	2.1395	19 4 2.4	1.110
19	16 11 41.71	2.0802	18 15 34.5	3.095	19	17 53 12.01	2.1402	19 2 53.0	1.203
20	16 13 46.58	2.0820	18 18 37.7	3.012	20	17 55 20.44	2.1409	19 1 38.1	1.295
21	16 15 51.55	2.0837	18 21 35.9	2.928	21	17 57 28.92	2.1416	19 0 17.6	1.388
22	16 17 56.62	2.0854	18 24 29.1	2.844	22	17 59 37.43	2.1422	18 58 51.5	1.482
23	16 20 1.80	2.0872	S. 18 27 17.2	2.759	23	18 1 45.98	2.1427	S. 18 57 19.8	1.575
	FRIDAY 2.					**SUNDAY 4.**			
0	16 22 7.08	2.0888	S. 18 30 0.2	2.674	0	18 3 54.56	2.1432	S. 18 55 42.5	1.668
1	16 24 12.46	2.0905	18 32 38.1	2.589	1	18 6 3.17	2.1438	18 53 59.6	1.762
2	16 26 17.94	2.0922	18 35 10.9	2.503	2	18 8 11.82	2.1444	18 52 11.1	1.855
3	16 28 23.52	2.0938	18 37 38.5	2.417	3	18 10 20.50	2.1449	18 50 17.0	1.948
4	16 30 29.20	2.0954	18 40 0.9	2.331	4	18 12 29.21	2.1454	18 48 17.3	2.041
5	16 32 34.97	2.0970	18 42 18.2	2.245	5	18 14 37.95	2.1458	18 46 12.1	2.133
6	16 34 40.84	2.0986	18 44 30.3	2.158	6	18 16 46.71	2.1462	18 44 1.3	2.227
7	16 36 46.80	2.1001	18 46 37.1	2.070	7	18 18 55.50	2.1467	18 41 44.9	2.320
8	16 38 52.85	2.1017	18 48 38.7	1.983	8	18 21 4.31	2.1471	18 39 22.9	2.413
9	16 40 59.00	2.1032	18 50 35.1	1.896	9	18 23 13.15	2.1475	18 36 55.3	2.506
10	16 43 5.24	2.1046	18 52 26.2	1.808	10	18 25 22.01	2.1478	18 34 22.2	2.599
11	16 45 11.56	2.1060	18 54 12.0	1.719	11	18 27 30.89	2.1482	18 31 43.5	2.692
12	16 47 17.96	2.1074	18 55 52.5	1.631	12	18 29 39.80	2.1486	18 28 59.2	2.784
13	16 49 24.45	2.1089	18 57 27.7	1.542	13	18 31 48.72	2.1488	18 26 9.4	2.877
14	16 51 31.03	2.1103	18 58 57.5	1.453	14	18 33 57.66	2.1491	18 23 14.0	2.970
15	16 53 37.69	2.1117	19 0 22.0	1.364	15	18 36 6.61	2.1493	18 20 13.0	3.062
16	16 55 44.43	2.1130	19 1 41.2	1.275	16	18 38 15.58	2.1496	18 17 6.5	3.154
17	16 57 51.25	2.1144	19 2 55.0	1.185	17	18 40 24.56	2.1498	18 13 54.5	3.247
18	16 59 58.16	2.1157	19 4 3.4	1.095	18	18 42 33.56	2.1501	18 10 36.9	3.339
19	17 2 5.14	2.1170	19 5 6.4	1.005	19	18 44 42.57	2.1502	18 7 13.8	3.431
20	17 4 12.20	2.1182	19 6 4.0	0.915	20	18 46 51.59	2.1505	18 3 45.2	3.523
21	17 6 19.33	2.1194	19 6 56.2	0.824	21	18 49 0.63	2.1507	18 0 11.1	3.615
22	17 8 26.53	2.1206	19 7 42.9	0.733	22	18 51 9.67	2.1508	17 56 31.4	3.707
23	17 10 33.80	2.1218	19 8 24.2	0.643	23	18 53 18.72	2.1509	17 52 46.3	3.798
24	17 12 41.15	2.1230	S. 19 9 0.1	0.552	24	18 55 27.78	2.1511	S. 17 48 55.7	3.889

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 5.					WEDNESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 55 27.78	2.1511	S. 17 48 55.7	3.889	0	20 38 44.31	2.1525	S. 13 1 40.9	7.956
1	18 57 36.85	2.1512	17 44 59.6	3.980	1	20 40 53.47	2.1527	12 53 41.3	8.032
2	18 59 45.92	2.1513	17 40 58.1	4.071	2	20 43 2.64	2.1529	12 45 37.1	8.107
3	19 1 55.00	2.1513	17 36 51.1	4.162	3	20 45 11.82	2.1532	12 37 28.4	8.182
4	19 4 4.08	2.1514	17 32 38.7	4.252	4	20 47 21.02	2.1535	12 29 15.3	8.256
5	19 6 13.17	2.1515	17 28 20.9	4.342	5	20 49 30.24	2.1537	12 20 57.7	8.330
6	19 8 22.26	2.1515	17 23 57.6	4.433	6	20 51 39.47	2.1540	12 12 35.7	8.403
7	19 10 31.35	2.1516	17 19 28.9	4.523	7	20 53 48.72	2.1543	12 4 9.4	8.475
8	19 12 40.45	2.1517	17 14 54.8	4.612	8	20 55 57.99	2.1547	11 55 38.7	8.547
9	19 14 49.55	2.1517	17 10 15.4	4.702	9	20 58 7.28	2.1550	11 47 3.7	8.618
10	19 16 58.65	2.1517	17 5 30.6	4.792	10	21 0 16.59	2.1553	11 38 24.5	8.689
11	19 19 7.75	2.1518	17 0 40.4	4.881	11	21 2 25.92	2.1557	11 29 41.0	8.760
12	19 21 16.86	2.1518	16 55 44.9	4.969	12	21 4 35.28	2.1562	11 20 53.3	8.830
13	19 23 25.97	2.1518	16 50 44.1	5.058	13	21 6 44.67	2.1567	11 12 1.4	8.899
14	19 25 35.07	2.1517	16 45 38.0	5.147	14	21 8 54.08	2.1571	11 3 5.4	8.967
15	19 27 44.17	2.1517	16 40 26.5	5.235	15	21 11 3.52	2.1576	10 54 5.3	9.036
16	19 29 53.27	2.1517	16 35 9.8	5.322	16	21 13 12.99	2.1581	10 45 1.1	9.103
17	19 32 2.37	2.1517	16 29 47.8	5.410	17	21 15 22.49	2.1587	10 35 52.9	9.170
18	19 34 11.47	2.1517	16 24 20.6	5.497	18	21 17 32.03	2.1592	10 26 40.7	9.237
19	19 36 20.57	2.1517	16 18 48.2	5.584	19	21 19 41.60	2.1598	10 17 24.5	9.303
20	19 38 29.67	2.1516	16 13 10.5	5.671	20	21 21 51.21	2.1605	10 8 4.4	9.368
21	19 40 38.76	2.1515	16 7 27.6	5.757	21	21 24 0.86	2.1612	9 58 40.4	9.433
22	19 42 47.85	2.1515	16 1 39.6	5.843	22	21 26 10.55	2.1618	9 49 12.5	9.496
23	19 44 56.94	2.1515	S. 15 55 46.4	5.930	23	21 28 20.28	2.1626	S. 9 39 40.8	9.559
	TUESDAY 6.					THURSDAY 8.			
0	19 47 6.03	2.1515	S. 15 49 48.0	6.016	0	21 30 30.06	2.1634	S. 9 30 5.4	9.622
1	19 49 15.12	2.1515	15 43 44.5	6.101	1	21 32 39.89	2.1642	9 20 26.2	9.684
2	19 51 24.21	2.1514	15 37 35.9	6.185	2	21 34 49.76	2.1649	9 10 43.3	9.746
3	19 53 33.29	2.1513	15 31 22.3	6.269	3	21 36 59.68	2.1658	9 0 56.7	9.807
4	19 55 42.37	2.1513	15 25 3.6	6.353	4	21 39 9.65	2.1667	8 51 6.5	9.866
5	19 57 51.45	2.1513	15 18 39.9	6.437	5	21 41 19.68	2.1676	8 41 12.8	9.925
6	20 0 0.53	2.1513	15 12 11.1	6.521	6	21 43 29.76	2.1685	8 31 15.5	9.984
7	20 2 9.61	2.1513	15 5 37.3	6.604	7	21 45 39.90	2.1695	8 21 14.7	10.042
8	20 4 18.69	2.1513	14 58 58.6	6.687	8	21 47 50.10	2.1705	8 11 10.5	10.098
9	20 6 27.77	2.1513	14 52 14.9	6.769	9	21 50 0.36	2.1716	8 1 2.9	10.155
10	20 8 36.85	2.1513	14 45 26.3	6.851	10	21 52 10.69	2.1727	7 50 51.9	10.212
11	20 10 45.93	2.1513	14 38 32.8	6.933	11	21 54 21.08	2.1738	7 40 37.5	10.267
12	20 12 55.01	2.1513	14 31 34.3	7.015	12	21 56 31.54	2.1749	7 30 19.8	10.321
13	20 15 4.09	2.1514	14 24 31.0	7.095	13	21 58 42.07	2.1762	7 19 58.9	10.374
14	20 17 13.18	2.1515	14 17 22.9	7.175	14	22 0 52.68	2.1774	7 9 34.9	10.427
15	20 19 22.27	2.1515	14 10 9.9	7.256	15	22 3 3.36	2.1787	6 59 7.7	10.479
16	20 21 31.36	2.1516	14 2 52.2	7.335	16	22 5 14.12	2.1800	6 48 37.4	10.530
17	20 23 40.46	2.1517	13 55 29.7	7.415	17	22 7 24.96	2.1813	6 38 4.1	10.580
18	20 25 49.56	2.1517	13 48 2.4	7.494	18	22 9 35.88	2.1827	6 27 27.8	10.630
19	20 27 58.67	2.1518	13 40 30.4	7.572	19	22 11 46.89	2.1842	6 16 48.5	10.679
20	20 30 7.78	2.1519	13 32 53.8	7.649	20	22 13 57.98	2.1856	6 6 6.3	10.727
21	20 32 16.90	2.1521	13 25 12.5	7.727	21	22 16 9.16	2.1871	5 55 21.3	10.773
22	20 34 26.03	2.1522	13 17 26.5	7.804	22	22 18 20.43	2.1887	5 44 33.5	10.820
23	20 36 35.17	2.1523	13 9 36.0	7.880	23	22 20 31.80	2.1902	5 33 42.9	10.866
24	20 38 44.31	2.1525	S. 13 1 40.9	7.956	24	22 22 43.26	2.1918	S. 5 22 49.6	10.911

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 22 43.26	2.1918	S. 5 22 49.6	10.911
1	22 24 54.82	2.1935	5 11 53.6	10.954
2	22 27 6.48	2.1952	5 0 55.1	10.996
3	22 29 18.25	2.1970	4 49 54.1	11.037
4	22 31 30.12	2.1988	4 38 50.6	11.079
5	22 33 42.10	2.2007	4 27 44.6	11.120
6	22 35 54.20	2.2026	4 16 36.2	11.159
7	22 38 6.41	2.2045	4 5 25.5	11.197
8	22 40 18.74	2.2064	3 54 12.5	11.234
9	22 42 31.18	2.2083	3 42 57.4	11.270
10	22 44 43.74	2.2104	3 31 40.1	11.306
11	22 46 56.43	2.2126	3 20 20.7	11.340
12	22 49 9.25	2.2147	3 8 59.3	11.373
13	22 51 22.20	2.2169	2 57 35.9	11.406
14	22 53 35.28	2.2191	2 46 10.6	11.437
15	22 55 48.49	2.2213	2 34 43.4	11.468
16	22 58 1.84	2.2236	2 23 14.4	11.497
17	23 0 15.33	2.2260	2 11 43.7	11.525
18	23 2 28.96	2.2284	2 0 11.4	11.552
19	23 4 42.74	2.2309	1 48 37.5	11.578
20	23 6 56.67	2.2333	1 37 2.0	11.604
21	23 9 10.74	2.2358	1 25 25.0	11.628
22	23 11 24.97	2.2385	1 13 46.6	11.651
23	23 13 39.36	2.2411	S. 1 2 6.9	11.672

SATURDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 15 53.90	2.2437	S. 0 50 25.9	11.693
1	23 18 8.60	2.2464	0 38 43.7	11.712
2	23 20 23.47	2.2492	0 27 0.4	11.731
3	23 22 38.51	2.2521	0 15 16.0	11.748
4	23 24 53.72	2.2549	S. 0 3 30.6	11.764
5	23 27 9.10	2.2578	N. 0 8 15.7	11.779
6	23 29 24.65	2.2607	0 20 2.9	11.793
7	23 31 40.38	2.2637	0 31 50.9	11.806
8	23 33 56.29	2.2667	0 43 39.6	11.817
9	23 36 12.38	2.2697	0 55 28.9	11.826
10	23 38 28.65	2.2728	1 7 18.7	11.834
11	23 40 45.11	2.2759	1 19 9.0	11.842
12	23 43 1.76	2.2791	1 30 59.7	11.848
13	23 45 18.60	2.2823	1 42 50.8	11.853
14	23 47 35.64	2.2856	1 54 42.1	11.857
15	23 49 52.87	2.2888	2 6 33.6	11.859
16	23 52 10.30	2.2922	2 18 25.2	11.861
17	23 54 27.94	2.2957	2 30 16.9	11.861
18	23 56 45.78	2.2991	2 42 8.5	11.859
19	23 59 3.83	2.3026	2 53 59.9	11.856
20	0 1 22.09	2.3060	3 5 51.2	11.852
21	0 3 40.55	2.3095	3 17 42.2	11.847
22	0 5 59.23	2.3131	3 29 32.8	11.839
23	0 8 18.13	2.3167	3 41 22.9	11.830
24	0 10 37.24	2.3203	N. 3 53 12.4	11.820

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 10 37.24	2.3203	N. 3 53 12.4	11.820
1	0 12 56.57	2.3240	4 5 1.3	11.809
2	0 15 16.12	2.3278	4 16 49.5	11.797
3	0 17 35.90	2.3316	4 28 36.9	11.783
4	0 19 55.91	2.3353	4 40 23.4	11.767
5	0 22 16.14	2.3391	4 52 8.9	11.750
6	0 24 36.60	2.3430	5 3 53.4	11.732
7	0 26 57.30	2.3469	5 15 36.7	11.712
8	0 29 18.23	2.3508	5 27 18.8	11.691
9	0 31 39.39	2.3547	5 38 59.6	11.667
10	0 34 0.79	2.3587	5 50 38.9	11.642
11	0 36 22.43	2.3627	6 2 16.6	11.615
12	0 38 44.31	2.3667	6 13 52.7	11.588
13	0 41 6.43	2.3707	6 25 27.2	11.560
14	0 43 28.80	2.3748	6 36 59.9	11.529
15	0 45 51.41	2.3789	6 48 30.7	11.497
16	0 48 14.27	2.3831	6 59 59.5	11.463
17	0 50 37.38	2.3872	7 11 26.3	11.428
18	0 53 0.73	2.3913	7 22 50.9	11.392
19	0 55 24.33	2.3955	7 34 13.3	11.353
20	0 57 48.19	2.3997	7 45 33.3	11.313
21	1 0 12.30	2.4039	7 56 50.9	11.272
22	1 2 36.66	2.4081	8 8 6.0	11.230
23	1 5 1.27	2.4123	N. 8 19 18.5	11.185

MONDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 7 26.14	2.4166	N. 8 30 28.2	11.138
1	1 9 51.26	2.4208	8 41 35.1	11.091
2	1 12 16.64	2.4252	8 52 39.1	11.042
3	1 14 42.28	2.4295	9 3 40.1	10.991
4	1 17 8.18	2.4337	9 14 38.0	10.938
5	1 19 34.33	2.4380	9 25 32.7	10.883
6	1 22 0.74	2.4423	9 36 24.0	10.827
7	1 24 27.41	2.4466	9 47 11.9	10.770
8	1 26 54.33	2.4508	9 57 56.4	10.712
9	1 29 21.51	2.4552	10 8 37.3	10.651
10	1 31 48.95	2.4595	10 19 14.5	10.588
11	1 34 16.65	2.4637	10 29 47.9	10.525
12	1 36 44.60	2.4680	10 40 17.5	10.460
13	1 39 12.81	2.4723	10 50 43.1	10.392
14	1 41 41.28	2.4766	11 1 4.6	10.323
15	1 44 10.00	2.4808	11 11 21.9	10.253
16	1 46 38.98	2.4851	11 21 35.0	10.182
17	1 49 8.21	2.4892	11 31 43.7	10.108
18	1 51 37.69	2.4935	11 41 47.9	10.033
19	1 54 7.43	2.4977	11 51 47.6	9.956
20	1 56 37.42	2.5018	12 1 42.6	9.877
21	1 59 7.65	2.5059	12 11 32.9	9.798
22	2 1 38.13	2.5101	12 21 18.4	9.717
23	2 4 8.86	2.5142	12 30 59.0	9.634
24	2 6 39.84	2.5183	N. 12 40 34.5	9.549

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 6 39.84	2.5183	N.12 40 34.5	9.549
1	2 9 11.06	2.5223	12 50 4.9	9.463
2	2 11 42.52	2.5263	12 59 30.1	9.376
3	2 14 14.22	2.5303	13 8 50.0	9.287
4	2 16 46.15	2.5342	13 18 4.5	9.196
5	2 19 18.32	2.5381	13 27 13.5	9.104
6	2 21 50.72	2.5419	13 36 17.0	9.011
7	2 24 23.35	2.5458	13 45 14.8	8.915
8	2 26 56.21	2.5496	13 54 6.8	8.818
9	2 29 29.30	2.5533	14 2 53.0	8.721
10	2 32 2.61	2.5570	14 11 33.3	8.622
11	2 34 36.14	2.5606	14 20 7.6	8.521
12	2 37 9.88	2.5642	14 28 35.8	8.418
13	2 39 43.84	2.5677	14 36 57.8	8.314
14	2 42 18.01	2.5712	14 45 13.5	8.209
15	2 44 52.38	2.5745	14 53 22.9	8.103
16	2 47 26.95	2.5778	15 1 25.9	7.996
17	2 50 1.72	2.5811	15 9 22.4	7.886
18	2 52 36.69	2.5844	15 17 12.2	7.775
19	2 55 11.85	2.5875	15 24 55.4	7.664
20	2 57 47.19	2.5906	15 32 31.9	7.552
21	3 0 22.72	2.5936	15 40 1.6	7.437
22	3 2 58.42	2.5965	15 47 24.3	7.321
23	3 5 34.30	2.5994	N.15 54 40.1	7.205

WEDNESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 8 10.35	2.6022	N.16 1 48.9	7.087
1	3 10 46.56	2.6049	16 8 50.6	6.968
2	3 13 22.93	2.6075	16 15 45.1	6.847
3	3 15 59.46	2.6101	16 22 32.3	6.726
4	3 18 36.14	2.6125	16 29 12.2	6.604
5	3 21 12.96	2.6148	16 35 44.8	6.482
6	3 23 49.92	2.6171	16 42 10.0	6.357
7	3 26 27.02	2.6193	16 48 27.6	6.231
8	3 29 4.24	2.6213	16 54 37.7	6.105
9	3 31 41.58	2.6233	17 0 40.2	5.977
10	3 34 19.04	2.6253	17 6 35.0	5.849
11	3 36 56.62	2.6272	17 12 22.1	5.721
12	3 39 34.30	2.6288	17 18 1.5	5.591
13	3 42 12.08	2.6304	17 23 33.0	5.459
14	3 44 49.95	2.6320	17 28 56.6	5.328
15	3 47 27.92	2.6335	17 34 12.4	5.196
16	3 50 5.97	2.6347	17 39 20.2	5.062
17	3 52 44.09	2.6359	17 44 19.9	4.928
18	3 55 22.28	2.6370	17 49 11.6	4.794
19	3 58 0.53	2.6380	17 53 55.2	4.659
20	4 0 38.84	2.6389	17 58 30.7	4.523
21	4 3 17.20	2.6397	18 2 58.0	4.387
22	4 5 55.61	2.6404	18 7 17.1	4.250
23	4 8 34.05	2.6409	18 11 28.0	4.113
24	4 11 12.52	2.6414	N.18 15 30.7	3.976

THURSDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 11 12.52	2.6414	N.18 15 30.7	3.976
1	4 13 51.02	2.6417	18 19 25.1	3.837
2	4 16 29.53	2.6419	18 23 14.1	3.697
3	4 19 8.05	2.6421	18 26 48.7	3.557
4	4 21 46.58	2.6421	18 30 18.0	3.418
5	4 24 25.10	2.6419	18 33 38.9	3.279
6	4 27 3.61	2.6417	18 36 51.5	3.140
7	4 29 42.10	2.6413	18 39 55.7	2.999
8	4 32 20.57	2.6409	18 42 51.4	2.858
9	4 34 59.01	2.6403	18 45 38.6	2.717
10	4 37 37.41	2.6396	18 48 17.4	2.576
11	4 40 15.76	2.6387	18 50 47.7	2.435
12	4 42 54.06	2.6378	18 53 9.6	2.294
13	4 45 32.30	2.6368	18 55 23.0	2.153
14	4 48 10.48	2.6357	18 57 27.9	2.012
15	4 50 48.58	2.6343	18 59 24.4	1.871
16	4 53 26.60	2.6329	19 1 12.4	1.729
17	4 56 4.53	2.6314	19 2 51.9	1.588
18	4 58 42.37	2.6298	19 4 22.9	1.447
19	5 1 20.11	2.6281	19 5 45.5	1.306
20	5 3 57.74	2.6263	19 6 59.6	1.165
21	5 6 35.26	2.6243	19 8 5.3	1.025
22	5 9 12.66	2.6222	19 9 2.6	0.885
23	5 11 49.92	2.6199	N.19 9 51.5	0.745

FRIDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 14 27.05	2.6176	N.19 10 32.0	0.605
1	5 17 4.04	2.6152	19 11 4.1	0.466
2	5 19 40.88	2.6128	19 11 27.9	0.327
3	5 22 17.57	2.6102	19 11 43.3	0.188
4	5 24 54.10	2.6074	19 11 50.4	+ 0.049
5	5 27 30.46	2.6045	19 11 49.2	− 0.089
6	5 30 6.64	2.6015	19 11 39.7	0.227
7	5 32 42.64	2.5985	19 11 22.0	0.363
8	5 35 18.46	2.5954	19 10 56.1	0.499
9	5 37 54.09	2.5922	19 10 22.1	0.635
10	5 40 29.52	2.5888	19 9 39.9	0.771
11	5 43 4.74	2.5853	19 8 49.6	0.905
12	5 45 39.75	2.5817	19 7 51.3	1.039
13	5 48 14.54	2.5781	19 6 44.9	1.172
14	5 50 49.12	2.5744	19 5 30.6	1.305
15	5 53 23.47	2.5705	19 4 8.3	1.437
16	5 55 57.58	2.5666	19 2 38.1	1.568
17	5 58 31.46	2.5627	19 1 0.1	1.699
18	6 1 5.10	2.5586	18 59 14.2	1.829
19	6 3 38.49	2.5543	18 57 20.6	1.958
20	6 6 11.62	2.5500	18 55 19.3	2.086
21	6 8 44.49	2.5457	18 53 10.3	2.213
22	6 11 17.10	2.5413	18 50 53.7	2.340
23	6 13 49.45	2.5369	18 48 29.5	2.465
24	6 16 21.53	2.5323	N.18 45 57.9	2.589

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 17.					**MONDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 16 21.53	2.5323	N.18 45 57.9	2.589	0	8 11 41.60	2.2639	N.14 37 41.5	7.322
1	6 18 53.33	2.5276	18 43 18.8	2.713	1	8 13 57.26	2.2582	14 30 20.0	7.393
2	6 21 24.86	2.5228	18 40 32.3	2.837	2	8 16 12.58	2.2524	14 22 54.3	7.462
3	6 23 56.09	2.5181	18 37 38.4	2.959	3	8 18 27.55	2.2466	14 15 24.5	7.531
4	6 26 27.01	2.5132	18 34 37.2	3.080	4	8 20 42.17	2.2408	14 7 50.6	7.598
5	6 28 57.65	2.5083	18 31 28.8	3.200	5	8 22 56.45	2.2351	14 0 12.7	7.665
6	6 31 28.00	2.5033	18 28 13.2	3.319	6	8 25 10.38	2.2293	13 52 30.8	7.730
7	6 33 58.05	2.4982	18 24 50.5	3.437	7	8 27 23.97	2.2237	13 44 45.1	7.793
8	6 36 27.79	2.4931	18 21 20.7	3.555	8	8 29 37.22	2.2181	13 36 55.6	7.856
9	6 38 57.22	2.4879	18 17 43.9	3.671	9	8 31 50.14	2.2125	13 29 2.3	7.918
10	6 41 26.34	2.4827	18 14 0.2	3.785	10	8 34 2.72	2.2069	13 21 5.4	7.978
11	6 43 55.15	2.4775	18 10 9.7	3.899	11	8 36 14.97	2.2013	13 13 4.9	8.038
12	6 46 23.64	2.4722	18 6 12.4	4.012	12	8 38 26.88	2.1957	13 5 0.8	8.097
13	6 48 51.81	2.4668	18 2 8.3	4.124	13	8 40 38.46	2.1902	12 56 53.2	8.155
14	6 51 19.65	2.4613	17 57 57.5	4.234	14	8 42 49.71	2.1848	12 48 42.2	8.211
15	6 53 47.17	2.4559	17 53 40.2	4.343	15	8 45 0.64	2.1794	12 40 27.9	8.266
16	6 56 14.36	2.4504	17 49 16.3	4.452	16	8 47 11.24	2.1740	12 32 10.3	8.321
17	6 58 41.22	2.4449	17 44 45.9	4.560	17	8 49 21.52	2.1686	12 23 49.4	8.374
18	7 1 7.75	2.4393	17 40 9.1	4.667	18	8 51 31.47	2.1633	12 15 25.4	8.426
19	7 3 33.94	2.4337	17 35 25.9	4.772	19	8 53 41.11	2.1580	12 6 58.3	8.477
20	7 5 59.79	2.4280	17 30 36.4	4.877	20	8 55 50.43	2.1528	11 58 28.1	8.528
21	7 8 25.30	2.4223	17 25 40.7	4.980	21	8 57 59.44	2.1476	11 49 54.9	8.577
22	7 10 50.47	2.4167	17 20 38.8	5.082	22	9 0 8.14	2.1424	11 41 18.8	8.626
23	7 13 15.30	2.4109	N.17 15 30.9	5.182	23	9 2 16.53	2.1373	N.11 32 39.8	8.673
	SUNDAY 18.					**TUESDAY 20.**			
0	7 15 39.78	2.4051	N.17 10 17.0	5.282	0	9 4 24.62	2.1322	N.11 23 58.0	8.720
1	7 18 3.91	2.3993	17 4 57.1	5.380	1	9 6 32.40	2.1272	11 15 13.4	8.765
2	7 20 27.70	2.3936	16 59 31.4	5.477	2	9 8 39.88	2.1222	11 6 26.2	8.809
3	7 22 51.14	2.3877	16 53 59.9	5.573	3	9 10 47.06	2.1173	10 57 36.4	8.852
4	7 25 14.23	2.3818	16 48 22.6	5.668	4	9 12 53.95	2.1124	10 48 44.0	8.895
5	7 27 36.96	2.3759	16 42 39.7	5.762	5	9 15 0.55	2.1075	10 39 49.0	8.937
6	7 29 59.34	2.3701	16 36 51.2	5.854	6	9 17 6.85	2.1027	10 30 51.6	8.977
7	7 32 21.37	2.3642	16 30 57.2	5.946	7	9 19 12.87	2.0979	10 21 51.8	9.017
8	7 34 43.04	2.3582	16 24 57.7	6.037	8	9 21 18.60	2.0932	10 12 49.6	9.056
9	7 37 4.36	2.3523	16 18 52.8	6.126	9	9 23 24.05	2.0885	10 3 45.1	9.093
10	7 39 25.32	2.3464	16 12 42.6	6.213	10	9 25 29.22	2.0838	9 54 38.4	9.130
11	7 41 45.93	2.3406	16 6 27.2	6.300	11	9 27 34.11	2.0792	9 45 29.5	9.167
12	7 44 6.19	2.3347	16 0 6.6	6.386	12	9 29 38.73	2.0747	9 36 18.4	9.203
13	7 46 26.09	2.3287	15 53 40.9	6.470	13	9 31 43.08	2.0702	9 27 5.2	9.237
14	7 48 45.63	2.3227	15 47 10.2	6.553	14	9 33 47.16	2.0658	9 17 50.0	9.269
15	7 51 4.82	2.3168	15 40 34.5	6.636	15	9 35 50.98	2.0615	9 8 32.9	9.301
16	7 53 23.65	2.3109	15 33 53.9	6.717	16	9 37 54.54	2.0572	8 59 13.9	9.333
17	7 55 42.13	2.3051	15 27 8.5	6.796	17	9 39 57.84	2.0529	8 49 53.0	9.364
18	7 58 0.26	2.2992	15 20 18.4	6.874	18	9 42 0.89	2.0487	8 40 30.2	9.394
19	8 0 18.03	2.2932	15 13 23.6	6.952	19	9 44 3.68	2.0445	8 31 5.7	9.423
20	8 2 35.45	2.2873	15 6 24.1	7.029	20	9 46 6.23	2.0404	8 21 39.5	9.451
21	8 4 52.51	2.2814	14 59 20.1	7.104	21	9 48 8.53	2.0363	8 12 11.6	9.479
22	8 7 9.22	2.2756	14 52 11.6	7.178	22	9 50 10.59	2.0323	8 2 42.0	9.507
23	8 9 25.59	2.2696	14 44 58.7	7.251	23	9 52 12.41	2.0283	7 53 10.8	9.533
24	8 11 41.60	2.2639	N.14 37 41.5	7.322	24	9 54 13.99	2.0244	N. 7 43 38.1	9.557

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 54 13.99	2.0244	N. 7 43 38.1	9.557
1	9 56 15.34	2.0206	7 34 4.0	9.581
2	9 58 16.46	2.0168	7 24 28.4	9.605
3	10 0 17.36	2.0132	7 14 51.4	9.627
4	10 2 18.04	2.0095	7 5 13.1	9.649
5	10 4 18.50	2.0058	6 55 33.5	9.670
6	10 6 18.74	2.0022	6 45 52.7	9.690
7	10 8 18.76	1.9986	6 36 10.7	9.710
8	10 10 18.57	1.9952	6 26 27.5	9.729
9	10 12 18.18	1.9918	6 16 43.2	9.747
10	10 14 17.58	1.9884	6 6 57.8	9.765
11	10 16 16.79	1.9851	5 57 11.4	9.781
12	10 18 15.80	1.9819	5 47 24.1	9.797
13	10 20 14.62	1.9787	5 37 35.8	9.812
14	10 22 13.25	1.9756	5 27 46.6	9.827
15	10 24 11.69	1.9725	5 17 56.6	9.841
16	10 26 9.95	1.9695	5 8 5.7	9.854
17	10 28 8.03	1.9665	4 58 14.1	9.866
18	10 30 5.93	1.9636	4 48 21.8	9.877
19	10 32 3.66	1.9607	4 38 28.8	9.888
20	10 34 1.22	1.9579	4 28 35.2	9.899
21	10 35 58.61	1.9552	4 18 40.9	9.909
22	10 37 55.84	1.9525	4 8 46.1	9.918
23	10 39 52.91	1.9499	N. 3 58 50.8	9.926

THURSDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 41 49.83	1.9473	N. 3 48 55.0	9.934
1	10 43 46.59	1.9447	3 38 58.7	9.941
2	10 45 43.20	1.9423	3 29 2.1	9.947
3	10 47 39.67	1.9400	3 19 5.1	9.953
4	10 49 36.00	1.9376	3 9 7.8	9.958
5	10 51 32.18	1.9352	2 59 10.2	9.963
6	10 53 28.22	1.9329	2 49 12.3	9.967
7	10 55 24.13	1.9308	2 39 14.2	9.969
8	10 57 19.92	1.9287	2 29 16.0	9.972
9	10 59 15.58	1.9266	2 19 17.6	9.974
10	11 1 11.11	1.9246	2 9 19.1	9.976
11	11 3 6.53	1.9227	1 59 20.5	9.977
12	11 5 1.83	1.9207	1 49 21.9	9.977
13	11 6 57.02	1.9189	1 39 23.3	9.976
14	11 8 52.10	1.9171	1 29 24.8	9.975
15	11 10 47.07	1.9153	1 19 26.3	9.973
16	11 12 41.94	1.9137	1 9 28.0	9.971
17	11 14 36.71	1.9120	0 59 29.8	9.968
18	11 16 31.38	1.9104	0 49 31.8	9.964
19	11 18 25.96	1.9089	0 39 34.1	9.960
20	11 20 20.45	1.9074	0 29 36.6	9.956
21	11 22 14.85	1.9059	0 19 39.4	9.951
22	11 24 9.16	1.9046	N. 0 9 42.5	9.945
23	11 26 3.40	1.9033	S. 0 0 14.0	9.938
24	11 27 57.56	1.9020	S. 0 10 10.1	9.932

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 27 57.56	1.9020	S. 0 10 10.1	9.932
1	11 29 51.64	1.9008	0 20 5.8	9.924
2	11 31 45.66	1.8997	0 30 1.0	9.916
3	11 33 39.61	1.8986	0 39 55.7	9.907
4	11 35 33.49	1.8975	0 49 49.8	9.897
5	11 37 27.31	1.8965	0 59 43.4	9.888
6	11 39 21.07	1.8956	1 9 36.4	9.878
7	11 41 14.78	1.8947	1 19 28.7	9.867
8	11 43 8.43	1.8938	1 29 20.4	9.856
9	11 45 2.03	1.8930	1 39 11.4	9.844
10	11 46 55.59	1.8923	1 49 1.6	9.831
11	11 48 49.11	1.8916	1 58 51.1	9.818
12	11 50 42.58	1.8909	2 8 39.8	9.804
13	11 52 36.02	1.8903	2 18 27.6	9.790
14	11 54 29.42	1.8897	2 28 14.6	9.776
15	11 56 22.79	1.8892	2 38 0.7	9.760
16	11 58 16.13	1.8888	2 47 45.8	9.743
17	12 0 9.45	1.8885	2 57 29.9	9.727
18	12 2 2.75	1.8882	3 7 13.0	9.710
19	12 3 56.03	1.8879	3 16 55.1	9.693
20	12 5 49.29	1.8876	3 26 36.2	9.676
21	12 7 42.54	1.8874	3 36 16.2	9.657
22	12 9 35.78	1.8872	3 45 55.0	9.638
23	12 11 29.01	1.8871	S. 3 55 32.7	9.618

SATURDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 13 22.23	1.8870	S. 4 5 9.2	9.598
1	12 15 15.45	1.8870	4 14 44.5	9.577
2	12 17 8.67	1.8871	4 24 18.5	9.556
3	12 19 1.90	1.8872	4 33 51.2	9.534
4	12 20 55.14	1.8873	4 43 22.6	9.511
5	12 22 48.38	1.8874	4 52 52.6	9.488
6	12 24 41.63	1.8877	5 2 21.2	9.465
7	12 26 34.90	1.8879	5 11 48.4	9.442
8	12 28 28.18	1.8882	5 21 14.2	9.418
9	12 30 21.48	1.8885	5 30 38.5	9.393
10	12 32 14.80	1.8889	5 40 1.3	9.367
11	12 34 8.15	1.8894	5 49 22.5	9.340
12	12 36 1.53	1.8899	5 58 42.1	9.313
13	12 37 54.94	1.8904	6 8 0.1	9.286
14	12 39 48.38	1.8909	6 17 16.5	9.259
15	12 41 41.85	1.8915	6 26 31.2	9.231
16	12 43 35.36	1.8922	6 35 44.2	9.202
17	12 45 28.91	1.8929	6 44 55.5	9.173
18	12 47 22.51	1.8937	6 54 5.0	9.143
19	12 49 16.15	1.8944	7 3 12.7	9.112
20	12 51 9.84	1.8952	7 12 18.5	9.082
21	12 53 3.58	1.8961	7 21 22.5	9.051
22	12 54 57.37	1.8969	7 30 24.6	9.018
23	12 56 51.21	1.8978	7 39 24.7	8.986
24	12 58 45.11	1.8988	S. 7 48 22.9	8.953

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.			
	h m s	s	° ′ ″	″
0	12 58 45.11	1.8988	S. 7 48 22.9	8.953
1	13 0 39.07	1.8998	7 57 19.1	8.919
2	13 2 33.09	1.9008	8 6 13.2	8.885
3	13 4 27.17	1.9019	8 15 5.3	8.851
4	13 6 21.32	1.9031	8 23 55.3	8.815
5	13 8 15.54	1.9042	8 32 43.1	8.779
6	13 10 9.83	1.9054	8 41 28.8	8.743
7	13 12 4.19	1.9067	8 50 12.3	8.707
8	13 13 58.63	1.9079	8 58 53.6	8.669
9	13 15 53.14	1.9092	9 7 32.6	8.631
10	13 17 47.73	1.9105	9 16 9.3	8.592
11	13 19 42.40	1.9119	9 24 43.7	8.554
12	13 21 37.16	1.9133	9 33 15.8	8.515
13	13 23 32.00	1.9147	9 41 45.5	8.474
14	13 25 26.93	1.9162	9 50 12.7	8.433
15	13 27 21.94	1.9176	9 58 37.5	8.392
16	13 29 17.04	1.9192	10 6 59.8	8.350
17	13 31 12.24	1.9207	10 15 19.5	8.307
18	13 33 7.53	1.9223	10 23 36.7	8.265
19	13 35 2.92	1.9240	10 31 51.3	8.222
20	13 36 58.41	1.9256	10 40 3.3	8.178
21	13 38 53.99	1.9273	10 48 12.7	8.134
22	13 40 49.68	1.9290	10 56 19.4	8.088
23	13 42 45.47	1.9307	S. 11 4 23.3	8.043
	MONDAY 26.			
0	13 44 41.36	1.9324	S. 11 12 24.5	7.997
1	13 46 37.36	1.9342	11 20 22.9	7.950
2	13 48 33.47	1.9360	11 28 18.5	7.902
3	13 50 29.68	1.9378	11 36 11.2	7.855
4	13 52 26.01	1.9397	11 44 1.1	7.807
5	13 54 22.45	1.9416	11 51 48.0	7.758
6	13 56 19.00	1.9435	11 59 32.0	7.708
7	13 58 15.67	1.9455	12 7 13.0	7.658
8	14 0 12.46	1.9474	12 14 51.0	7.608
9	14 2 9.36	1.9493	12 22 25.9	7.557
10	14 4 6.38	1.9513	12 29 57.8	7.505
11	14 6 3.52	1.9534	12 37 26.5	7.452
12	14 8 0.79	1.9555	12 44 52.1	7.400
13	14 9 58.18	1.9575	12 52 14.5	7.347
14	14 11 55.69	1.9596	12 59 33.7	7.293
15	14 13 53.33	1.9617	13 6 49.6	7.238
16	14 15 51.09	1.9638	13 14 2.3	7.183
17	14 17 48.98	1.9659	13 21 11.6	7.128
18	14 19 47.00	1.9680	13 28 17.6	7.072
19	14 21 45.14	1.9702	13 35 20.2	7.015
20	14 23 43.42	1.9724	13 42 19.4	6.957
21	14 25 41.83	1.9746	13 49 15.1	6.899
22	14 27 40.37	1.9768	13 56 7.3	6 841
23	14 29 39.05	1.9791	14 2 56.0	6.782
24	14 31 37.86	1.9813	S. 14 9 41.2	6.723

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 27.			
	h m s	s	° ′ ″	″
0	14 31 37.86	1.9813	S. 14 9 41.2	6.723
1	14 33 36.81	1.9836	14 16 22.8	6.663
2	14 35 35.89	1.9858	14 23 0.8	6.603
3	14 37 35.10	1.9880	14 29 35.1	6.542
4	14 39 34.45	1.9903	14 36 5.8	6.480
5	14 41 33.94	1.9926	14 42 32.7	6.417
6	14 43 33.56	1.9948	14 48 55.9	6.355
7	14 45 33.32	1.9972	14 55 15.3	6.292
8	14 47 33.22	1.9995	15 1 30.9	6.228
9	14 49 33.26	2.0018	15 7 42.6	6.163
10	14 51 33.44	2.0042	15 13 50.5	6.099
11	14 53 33.76	2.0065	15 19 54.5	6.033
12	14 55 34.22	2.0088	15 25 54.5	5.967
13	14 57 34.82	2.0112	15 31 50.6	5.901
14	14 59 35.56	2.0135	15 37 42.6	5.834
15	15 1 36.44	2.0158	15 43 30 6	5.766
16	15 3 37.46	2.0182	15 49 14.5	5.697
17	15 5 38.62	2.0205	15 54 54.3	5.629
18	15 7 39.92	2.0229	16 0 30.0	5.560
19	15 9 41.37	2.0253	16 6 1.5	5.490
20	15 11 42.96	2.0277	16 11 28.8	5.420
21	15 13 44.69	2.0300	16 16 51.9	5.349
22	15 15 46.56	2.0323	16 22 10.7	5.278
23	15 17 48.57	2.0347	S. 16 27 25.2	5.207
	WEDNESDAY 28.			
0	15 19 50.72	2.0370	S. 16 32 35.5	5.135
1	15 21 53.01	2.0393	16 37 41.4	5.062
2	15 23 55.44	2.0417	16 42 42.9	4.987
3	15 25 58.01	2.0440	16 47 39.9	4.913
4	15 28 0.72	2.0463	16 52 32.5	4.840
5	15 30 3.57	2.0486	16 57 20.7	4.766
6	15 32 6.55	2.0509	17 2 4.4	4.690
7	15 34 9.67	2.0532	17 6 43.5	4.614
8	15 36 12.93	2.0555	17 11 18.1	4.538
9	15 38 16.33	2.0577	17 15 48.1	4.462
10	15 40 19.86	2.0600	17 20 13.5	4.384
11	15 42 23.53	2.0622	17 24 34.2	4.306
12	15 44 27.33	2.0645	17 28 50.2	4.227
13	15 46 31.27	2.0667	17 33 1.5	4.149
14	15 48 35.34	2.0689	17 37 8.1	4.071
15	15 50 39.54	2.0711	17 41 10.0	3.992
16	15 52 43.87	2.0732	17 45 7.1	3.912
17	15 54 48.33	2.0754	17 48 59.4	3.831
18	15 56 52.92	2.0776	17 52 46.8	3.750
19	15 58 57.64	2.0797	17 56 29.4	3.669
20	16 1 2.49	2.0818	18 0 7.1	3.587
21	16 3 7.46	2.0839	18 3 39.8	3.504
22	16 5 12.56	2.0860	18 7 7.6	3.422
23	16 7 17.78	2.0881	18 10 30.5	3.340
24	16 9 23.13	2.0902	S. 18 13 48.4	3.257

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 29.			
	h m s	s	° ′ ″	″
0	16 9 23.13	2.0902	S. 18 13 48.4	3.257
1	16 11 28.60	2.0922	18 17 1.3	3.173
2	16 13 34.19	2.0942	18 20 9.1	3.088
3	16 15 39.90	2.0962	18 23 11.9	3.004
4	16 17 45.73	2.0981	18 26 9.6	2.919
5	16 19 51.67	2.1000	18 29 2.2	2.833
6	16 21 57.73	2.1019	18 31 49.6	2.747
7	16 24 3.90	2.1038	18 34 31.9	2.662
8	16 26 10.18	2.1057	18 37 9.0	2.576
9	16 28 16.58	2.1076	18 39 41.0	2.489
10	16 30 23.09	2.1093	18 42 7.7	2.402
11	16 32 29.70	2.1111	18 44 29.2	2.315
12	16 34 36.42	2.1128	18 46 45.5	2.227
13	16 36 43.24	2.1146	18 48 56.5	2.139
14	16 38 50.17	2.1163	18 51 2.2	2.050
15	16 40 57.20	2.1180	18 53 2.5	1.961
16	16 43 4.33	2.1196	18 54 57.5	1.872
17	16 45 11.55	2.1212	18 56 47.2	1.784
18	16 47 18.87	2.1228	18 58 31.6	1.695
19	16 49 26.29	2.1244	19 0 10.6	1.604
20	16 51 33.80	2.1259	19 1 44.1	1.513
21	16 53 41.40	2.1274	19 3 12.2	1.423
22	16 55 49.09	2.1288	19 4 34.9	1.332
23	16 57 56.86	2.1302	S. 19 5 52.1	1.242
	FRIDAY 30.			
0	17 0 4.72	2.1317	S. 19 7 3.9	1.151
1	17 2 12.66	2.1330	19 8 10.2	1.059
2	17 4 20.68	2.1344	19 9 11.0	0.967
3	17 6 28.79	2.1357	19 10 6.3	0.876
4	17 8 36.97	2.1370	19 10 56.1	0.784
5	17 10 45.23	2.1382	19 11 40.4	0.692
6	17 12 53.56	2.1395	19 12 19.1	0.599
7	17 15 1.97	2.1407	19 12 52.3	0.506
8	17 17 10.44	2.1418	19 13 19.9	0.413
9	17 19 18.98	2.1428	19 13 41.9	0.321
10	17 21 27.58	2.1439	19 13 58.4	0.228
11	17 23 36.25	2.1450	19 14 9.3	0.135
12	17 25 44.98	2.1460	19 14 14.6	− 0.042
13	17 27 53.77	2.1470	19 14 14.3	+ 0.052
14	17 30 2.62	2.1479	19 14 8.4	0.146
15	17 32 11.52	2.1488	19 13 56.8	0.240
16	17 34 20.48	2.1497	19 13 39.6	0.333
17	17 36 29.49	2.1505	19 13 16.8	0.427
18	17 38 38.54	2.1513	19 12 48.3	0.522
19	17 40 47.64	2.1521	19 12 14.2	0.616
20	17 42 56.79	2.1528	19 11 34.4	0.710
21	17 45 5.98	2.1535	19 10 49.0	0.804
22	17 47 15.21	2.1542	19 9 57.9	0.898
23	17 49 24.48	2.1548	19 9 1.2	0.992
24	17 51 33.79	2.1554	S. 19 7 58.8	1.087

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY, DECEMBER 1.			
	h m s	s	° ′ ″	″
0	17 51 33.79	2.1554	S. 19 7 58.8	1.087

PHASES OF THE MOON.

	d	h	m
☽ First Quarter . . .	7	12	4.4
○ Full Moon	14	4	37.3
☾ Last Quarter	21	1	43.6
● New Moon	29	6	54.2

	d	h
☾ Perigee	13	16.8
☾ Apogee	26	12.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	16° 20′ 51″	3439	17° 42′ 23″	3437	19° 3′ 58″	3433	20° 25′ 37″	3430
	α Aquilæ	E.	67 27 33	3531	66 7 43	3539	64 48 2	3549	63 28 32	3559
	Fomalhaut	E.	97 30 39	3515	96 10 32	3511	94 50 20	3506	93 30 3	3502
2	Sun	W.	27 14 46	3412	28 36 49	3408	29 58 56	3404	31 21 8	3399
	α Aquilæ	E.	56 54 14	3627	55 36 9	3646	54 18 24	3665	53 1 0	3686
	Fomalhaut	E.	86 47 36	3487	85 26 57	3485	84 6 16	3483	82 45 33	3481
3	Sun	W.	38 13 37	3371	39 36 26	3365	40 59 23	3358	42 22 27	3351
	α Aquilæ	E.	46 40 27	3832	45 25 58	3870	44 12 8	3914	42 59 2	3962
	Fomalhaut	E.	76 1 44	3481	74 40 59	3482	73 20 15	3484	71 59 33	3487
	α Pegasi	E.	91 36 23	3165	90 9 32	3159	88 42 34	3153	87 15 29	3147
4	Sun	W.	49 19 54	3312	50 43 51	3304	52 7 58	3294	53 32 16	3285
	Antares	W.	24 30 28	3162	25 57 22	3132	27 24 53	3104	28 52 58	3079
	Fomalhaut	E.	65 16 58	3508	63 56 43	3515	62 36 36	3524	61 16 38	3533
	α Pegasi	E.	79 58 15	3117	78 30 26	3111	77 2 30	3105	75 34 27	3099
5	Sun	W.	60 36 38	3233	62 2 8	3222	63 27 51	3210	64 53 48	3198
	Antares	W.	36 20 23	2976	37 51 6	2958	39 22 11	2941	40 53 38	2923
	Fomalhaut	E.	54 39 51	3601	53 21 18	3622	52 3 7	3644	50 45 20	3670
	α Pegasi	E.	68 12 18	3069	66 43 30	3063	65 14 35	3057	63 45 33	3052
6	Sun	W.	72 7 18	3133	73 34 48	3119	75 2 35	3104	76 30 40	3089
	Antares	W.	48 36 10	2842	50 9 43	2826	51 43 37	2811	53 17 51	2794
	Fomalhaut	E.	44 24 28	3856	43 10 23	3909	41 57 12	3969	40 45 2	4039
	α Pegasi	E.	56 18 52	3030	54 49 16	3027	53 19 37	3025	51 49 55	3024
7	Sun	W.	83 55 43	3011	85 25 42	2994	86 56 2	2977	88 26 43	2960
	Antares	W.	61 14 25	2712	62 50 49	2695	64 27 36	2678	66 4 45	2661
	α Pegasi	E.	44 21 31	3037	42 52 4	3045	41 22 47	3056	39 53 44	3071
	α Arietis	E.	86 31 25	2732	84 55 28	2718	83 19 12	2703	81 42 36	2687
8	Sun	W.	96 5 39	2872	97 38 34	2853	99 11 53	2835	100 45 36	2816
	Antares	W.	74 16 18	2574	75 55 48	2557	77 35 42	2539	79 16 1	2522
	α Arietis	E.	73 34 24	2610	71 55 43	2594	70 16 40	2579	68 37 16	2564
	Saturn	E.	106 29 57	2510	104 48 58	2494	103 7 36	2477	101 25 50	2460
	Aldebaran	E.	106 38 45	2537	104 58 23	2520	103 17 38	2503	101 36 29	2485
9	Sun	W.	108 40 16	2722	110 16 27	2704	111 53 2	2685	113 30 2	2666
	Antares	W.	87 43 46	2433	89 26 34	2415	91 9 47	2398	92 53 25	2380
	α Aquilæ	W.	41 41 21	3380	43 4 0	3300	44 28 11	3227	45 53 48	3159
	α Arietis	E.	60 15 2	2489	58 33 34	2475	56 51 46	2462	55 9 39	2449
	Saturn	E.	92 50 51	2372	91 6 36	2355	89 21 56	2337	87 36 50	2319
	Aldebaran	E.	93 4 33	2398	91 20 55	2380	89 36 52	2363	87 52 24	2345
10	Sun	W.	121 41 23	2574	123 20 54	2556	125 0 50	2538	126 41 10	2521
	α Aquilæ	W.	53 20 31	2887	54 53 6	2844	56 26 37	2802	58 1 2	2764
	α Arietis	E.	46 34 45	2394	44 51 2	2387	43 7 8	2381	41 23 6	2376
	Saturn	E.	78 45 2	2234	76 57 25	2217	75 9 23	2200	73 20 56	2184
	Aldebaran	E.	79 3 42	2259	77 16 42	2243	75 29 18	2226	73 41 30	2210
11	α Aquilæ	W.	66 4 52	2604	67 43 42	2577	69 23 8	2553	71 3 8	2529

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L of Diff.
1	Sun	W.	21° 47′ 19″	3427	23° 9′ 5″	3424	24° 30′ 54″	3420	25° 52′ 48″	3416
	α Aquilæ	E.	62 9 13	3571	60 50 7	3583	59 31 14	3597	58 12 36	3611
	Fomalhaut	E.	92 9 41	3498	90 49 15	3495	89 28 45	3492	88 8 12	3489
2	Sun	W.	32 43 26	3394	34 5 49	3388	35 28 19	3383	36 50 55	3378
	α Aquilæ	E.	51 43 58	3709	50 27 21	3736	49 11 12	3765	47 55 33	3796
	Fomalhaut	E.	81 24 48	3480	80 4 2	3480	78 43 16	3480	77 22 30	3480
3	Sun	W.	43 45 39	3344	45 8 59	3337	46 32 28	3329	47 56 6	3320
	α Aquilæ	E.	41 46 45	4016	40 35 21	4077	39 24 57	4144	38 15 38	4221
	Fomalhaut	E.	70 38 54	3489	69 18 18	3493	67 57 46	3497	66 37 19	3503
	α Pegasi	E.	85 48 16	3142	84 20 57	3135	82 53 30	3129	81 25 56	3124
4	Sun	W.	54 56 45	3276	56 21 25	3265	57 46 17	3255	59 11 21	3244
	Antares	W.	30 21 33	3056	31 50 37	3034	33 20 7	3013	34 50 3	2994
	Fomalhaut	E.	59 56 50	3544	58 37 14	3555	57 17 51	3569	55 58 43	3584
	α Pegasi	E.	74 6 16	3093	72 37 58	3087	71 9 32	3081	69 40 59	3074
5	Sun	W.	66 19 59	3186	67 46 25	3172	69 13 7	3160	70 40 4	3146
	Antares	W.	42 25 27	2907	43 57 37	2891	45 30 7	2875	47 2 58	2859
	Fomalhaut	E.	49 28 1	3698	48 11 12	3730	46 54 57	3768	45 39 21	3809
	α Pegasi	E.	62 16 25	3047	60 47 10	3042	59 17 49	3038	57 48 23	3034
6	Sun	W.	77 59 3	3074	79 27 44	3059	80 56 44	3043	82 26 4	3027
	Antares	W.	54 52 27	2778	56 27 24	2761	58 2 43	2745	59 38 23	2728
	Fomalhaut	E.	39 34 1	4118	38 24 17	4209	37 15 59	4311	36 9 17	4429
	α Pegasi	E.	50 20 12	3023	48 50 28	3024	47 20 45	3026	45 51 5	3031
7	Sun	W.	89 57 46	2943	91 29 10	2925	93 0 57	2907	94 33 7	2890
	Antares	W.	67 42 17	2644	69 20 12	2627	70 58 30	2610	72 37 12	2592
	α Pegasi	E.	38 24 59	3089	36 56 36	3112	35 28 41	3140	34 1 20	3176
	α Arietis	E.	80 5 39	2672	78 28 21	2657	76 50 43	2641	75 12 44	2626
8	Sun	W.	102 19 43	2798	103 54 14	2778	105 29 10	2759	107 4 31	2741
	Antares	W.	80 56 44	2504	82 37 52	2486	84 19 25	2468	86 1 23	2450
	α Arietis	E.	66 57 31	2548	65 17 25	2533	63 36 58	2518	61 56 10	2504
	Saturn	E.	99 43 40	2442	98 1 5	2424	96 18 5	2407	94 34 40	2390
	Aldebaran	E.	99 54 55	2468	98 12 57	2450	96 30 34	2433	94 47 46	2415
9	Sun	W.	115 7 28	2647	116 45 19	2629	118 23 35	2610	120 2 16	2501
	Antares	W.	94 37 28	2363	96 21 56	2346	98 6 48	2329	99 52 5	2312
	α Aquilæ	W.	47 20 46	3097	48 48 59	3038	50 18 24	2985	51 48 56	2935
	α Arietis	E.	53 27 14	2436	51 44 31	2424	50 1 31	2413	48 18 15	2403
	Saturn	E.	85 51 19	2302	84 5 23	2285	82 19 1	2268	80 32 14	2251
	Aldebaran	E.	86 7 30	2328	84 22 11	2311	82 36 27	2293	80 50 17	2276
10	Sun	W.	128 21 54	2504	130 3 2	2487	131 44 33	2472	133 26 26	2456
	α Aquilæ	W.	59 36 17	2728	61 12 20	2693	62 49 9	2662	64 26 40	2632
	α Arietis	E.	39 38 57	2374	37 54 45	2373	36 10 32	2376	34 26 23	2382
	Saturn	E.	71 32 5	2168	69 42 50	2153	67 53 12	2138	66 3 11	2123
	Aldebaran	E.	71 53 17	2194	70 4 40	2178	68 15 40	2164	66 26 18	2149
11	α Aquilæ	W.	72 43 41	2507	74 24 44	2488	76 6 14	2470	77 48 9	2453

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Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
11	Fomalhaut	W.	39° 2′ 45″	3467	40° 23′ 46″	3355	41° 46′ 54″	3253	43° 12′ 0″	3162
	Saturn	E.	64 12 47	2109	62 22 1	2095	60 30 54	2081	58 39 26	2068
	Aldebaran	E.	64 36 34	2135	62 46 28	2120	60 56 0	2107	59 5 11	2094
12	Fomalhaut	W.	50 41 39	2827	52 15 32	2778	53 50 29	2733	55 26 25	2692
	α Pegasi	W.	32 0 32	2677	33 37 43	2606	35 16 30	2545	36 56 41	2492
	Saturn	E.	49 17 19	2011	47 24 2	2001	45 30 30	1993	43 36 44	1984
	Aldebaran	E.	49 46 27	2038	47 53 52	2029	46 1 3	2020	44 8 0	2012
	Pollux	E.	92 39 55	2125	90 49 34	2115	88 58 58	2107	87 8 9	2099
	Jupiter	E.	105 36 51	2062	103 44 53	2052	101 52 40	2042	100 0 12	2034
13	Fomalhaut	W.	63 38 7	2542	65 18 22	2521	66 59 6	2502	68 40 16	2487
	α Pegasi	W.	45 33 29	2310	47 19 14	2287	49 5 33	2266	50 52 23	2247
	Saturn	E.	34 5 0	1954	32 10 13	1951	30 15 21	1948	28 20 24	1946
	Aldebaran	E.	34 40 7	1966	32 46 10	1963	30 52 9	1961	28 58 5	1961
	Pollux	E.	77 51 26	2072	75 59 44	2070	74 7 59	2069	72 16 12	2068
	Jupiter	E.	90 34 53	2002	88 41 22	1998	86 47 44	1994	84 54 1	1992
	Mars	E.	99 40 7	2116	97 49 33	2112	95 58 52	2109	94 8 6	2105
	Regulus	E.	114 21 16	1995	112 27 34	1990	110 33 44	1987	108 39 49	1984
14	Fomalhaut	W.	77 10 43	2438	78 53 24	2434	80 36 10	2432	82 18 59	2433
	α Pegasi	W.	59 52 7	2191	61 40 48	2185	63 29 38	2182	65 18 33	2180
	Pollux	E.	62 57 46	2085	61 6 24	2092	59 15 12	2100	57 24 13	2111
	Jupiter	E.	75 24 57	1994	73 31 13	1996	71 37 33	2000	69 43 58	2004
	Mars	E.	84 53 38	2105	83 2 47	2108	81 12 0	2112	79 21 19	2116
	Regulus	E.	99 9 32	1982	97 15 30	1985	95 21 32	1988	93 27 39	1993
15	α Pegasi	W.	74 23 14	2190	76 11 57	2195	78 0 32	2202	79 48 57	2210
	α Arietis	W.	30 50 29	2272	32 37 10	2254	34 24 17	2242	36 11 42	2234
	Pollux	E.	48 13 52	2183	46 24 59	2203	44 36 36	2226	42 48 47	2250
	Jupiter	E.	60 18 20	2041	58 25 49	2051	56 33 34	2061	54 41 35	2072
	Mars	E.	70 10 1	2152	68 20 21	2161	66 30 55	2172	64 41 46	2184
	Regulus	E.	84 0 16	2025	82 7 21	2033	80 14 39	2043	78 22 12	2054
16	α Pegasi	W.	88 47 26	2266	90 34 15	2280	92 20 44	2295	94 6 51	2311
	α Arietis	W.	45 10 26	2233	46 58 5	2239	48 45 35	2246	50 32 54	2255
	Jupiter	E.	45 26 30	2143	43 36 36	2160	41 47 8	2178	39 58 7	2196
	Mars	E.	55 40 42	2253	53 53 34	2270	52 6 51	2287	50 20 33	2305
	Regulus	E.	69 4 22	2116	67 13 47	2131	65 23 35	2146	63 33 46	2161
17	α Arietis	W.	59 25 44	2314	61 11 23	2328	62 56 42	2343	64 41 39	2358
	Saturn	W.	26 22 33	2200	28 11 0	2217	29 59 2	2234	31 46 39	2251
	Aldebaran	W.	25 37 22	2239	27 24 52	2254	29 11 59	2270	30 58 42	2287
	Mars	E.	41 36 4	2410	39 52 43	2433	38 9 56	2458	36 27 44	2485
	Regulus	E.	54 30 48	2247	52 43 31	2266	50 56 42	2286	49 10 22	2305
	Spica	E.	108 5 10	2221	106 17 14	2239	104 29 44	2256	102 42 40	2274
18	α Arietis	W.	73 20 37	2442	75 3 11	2460	76 45 20	2478	78 27 4	2497
	Saturn	W.	40 38 6	2344	42 23 2	2362	44 7 31	2381	45 51 33	2400
	Aldebaran	W.	39 46 3	2375	41 30 13	2393	43 13 57	2412	44 57 15	2431
	Regulus	E.	40 26 2	2410	38 42 42	2433	36 59 54	2456	35 17 39	2479
	Spica	E.	93 54 2	2367	92 9 40	2387	90 25 46	2405	88 42 19	2424
	Sun	E.	127 32 36	2696	125 55 51	2716	124 19 33	2737	122 43 42	2758

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11	Fomalhaut	W.	44° 38′ 54″	3081	46° 7′ 27″	3008	47° 37′ 30″	2942	49° 8′ 56″	2881
	SATURN	E.	56 47 38	2055	54 55 30	2044	53 3 4	2032	51 10 20	2021
	Aldebaran	E.	57 14 3	2082	55 22 36	2070	53 30 50	2059	51 38 47	2048
12	Fomalhaut	W.	57 3 16	2655	58 40 56	2623	60 19 20	2593	61 58 25	2566
	α Pegasi	W.	38 38 6	2445	40 20 37	2405	42 4 5	2369	43 48 24	2337
	SATURN	E.	41 42 44	1977	39 48 33	1970	37 54 11	1964	35 59 40	1958
	Aldebaran	E.	42 14 45	2005	40 21 19	1999	38 27 43	1994	36 33 59	1989
	Pollux	E.	85 17 8	2092	83 25 56	2085	81 34 34	2079	79 43 3	2075
	JUPITER	E.	98 7 31	2026	96 14 37	2019	94 21 32	2012	92 28 17	2007
13	Fomalhaut	W.	70 21 48	2472	72 3 40	2461	73 45 48	2451	75 28 10	2443
	α Pegasi	W.	52 39 40	2232	54 27 20	2218	56 15 20	2207	58 3 37	2198
	SATURN	E.	26 25 24	1944	24 30 22	1944	22 35 20	1945	20 40 19	1948
	Aldebaran	E.	27 4 1	1982	25 9 58	1984	23 15 58	1987	21 22 4	1994
	Pollux	E.	70 24 24	2070	68 32 38	2072	66 40 55	2075	64 49 17	2079
	JUPITER	E.	83 0 14	1991	81 6 25	1990	79 12 35	1990	77 18 45	1991
	MARS	E.	92 17 15	2104	90 26 22	2103	88 35 27	2103	86 44 32	2103
	Regulus	E.	106 45 49	1982	104 51 46	1980	102 57 41	1980	101 3 36	1981
14	Fomalhaut	W.	84 1 47	2434	85 44 33	2438	87 27 14	2442	89 9 48	2450
	α Pegasi	W.	67 7 31	2178	68 56 31	2179	70 45 30	2182	72 34 25	2186
	Pollux	E.	55 33 30	2122	53 43 4	2134	51 52 57	2149	50 3 12	2165
	JUPITER	E.	67 50 30	2010	65 57 11	2016	64 4 2	2024	62 11 5	2032
	MARS	E.	77 30 44	2121	75 40 17	2128	73 50 0	2135	71 59 54	2143
	Regulus	E.	91 33 53	1997	89 40 14	2003	87 46 44	2009	85 53 24	2017
15	α Pegasi	W.	81 37 9	2220	83 25 7	2230	85 12 50	2241	87 0 17	2253
	α Arietis	W.	37 59 19	2229	39 47 4	2226	41 34 53	2226	43 22 41	2229
	Pollux	E.	41 1 34	2277	39 15 1	2309	37 29 14	2344	35 44 18	2382
	JUPITER	E.	52 49 53	2084	50 58 30	2098	49 7 28	2113	47 16 48	2127
	MARS	E.	62 52 54	2196	61 4 20	2209	59 16 6	2223	57 28 13	2238
	Regulus	E.	76 30 2	2065	74 38 9	2077	72 46 34	2089	70 55 18	2102
16	α Pegasi	W.	95 52 34	2328	97 37 53	2345	99 22 47	2363	101 7 15	2382
	α Arietis	W.	52 20 0	2264	54 6 52	2276	55 53 27	2287	57 39 45	2300
	JUPITER	E.	38 9 34	2216	36 21 30	2237	34 33 58	2260	32 46 59	2263
	MARS	E.	48 34 41	2324	46 49 17	2344	45 4 22	2365	43 19 57	2387
	Regulus	E.	61 44 20	2177	59 55 18	2194	58 6 42	2212	56 18 32	2229
17	α Arietis	W.	66 26 14	2374	68 10 26	2391	69 54 14	2407	71 37 38	2425
	SATURN	W.	33 33 50	2270	35 20 34	2287	37 6 52	2306	38 52 43	2325
	Aldebaran	W.	32 45 1	2304	34 30 55	2321	36 16 24	2339	38 1 27	2357
	MARS	E.	34 46 10	2513	33 5 15	2543	31 25 1	2574	29 45 30	2607
	Regulus	E.	47 24 30	2326	45 39 8	2346	43 54 16	2367	42 9 54	2388
	Spica	E.	100 56 2	2292	99 9 51	2311	97 24 7	2330	95 38 51	2348
18	α Arietis	W.	80 8 22	2515	81 49 14	2533	83 29 41	2552	85 9 42	2571
	SATURN	W.	47 35 8	2419	49 18 16	2438	51 0 57	2457	52 43 11	2476
	Aldebaran	W.	46 40 6	2450	48 22 30	2468	50 4 28	2487	51 45 59	2507
	Regulus	E.	33 35 57	2504	31 54 50	2530	30 14 18	2556	28 34 22	2583
	Spica	E.	86 59 19	2443	85 16 46	2463	83 34 41	2482	81 53 3	2501
	SUN	E.	121 8 19	2778	119 33 23	2799	117 58 54	2820	116 24 52	2840

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Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
19	α Arietis	W.	86° 49′ 17″	2590	88° 28′ 26″	2608	90° 7′ 10″	2627	91° 45′ 28″	2646
	Saturn	W.	54 24 58	2494	56 6 19	2514	57 47 13	2532	59 27 42	2551
	Aldebaran	W.	53 27 3	2525	55 7 41	2543	56 47 54	2562	58 27 41	2581
	Spica	E.	80 11 51	2520	78 31 6	2539	76 50 47	2558	75 10 54	2577
	Sun	E.	114 51 16	2861	113 18 7	2881	111 45 24	2901	110 13 7	2922
20	Saturn	W.	67 43 48	2640	69 21 49	2657	70 59 27	2674	72 36 42	2691
	Aldebaran	W.	66 40 22	2670	68 17 42	2688	69 54 38	2704	71 31 12	2721
	Pollux	W.	26 17 54	3162	27 44 49	3128	29 12 25	3102	30 40 32	3083
	Spica	E.	66 57 48	2667	65 20 24	2684	63 43 23	2701	62 6 45	2718
	Sun	E.	102 38 2	3020	101 8 14	3038	99 38 49	3057	98 9 47	3075
21	Saturn	W.	80 37 30	2769	82 12 38	2784	83 47 27	2798	85 21 58	2811
	Aldebaran	W.	79 28 39	2799	81 3 8	2814	82 37 17	2829	84 11 7	2843
	Pollux	W.	38 5 20	3042	39 34 41	3041	41 4 3	3041	42 33 25	3043
	Jupiter	W.	24 0 29	2918	25 32 25	2920	27 4 19	2923	28 36 9	2927
	Spica	E.	54 9 0	2797	52 34 28	2812	51 0 16	2827	49 26 23	2841
	Sun	E.	90 50 3	3162	89 23 8	3177	87 56 32	3193	86 30 15	3209
22	Aldebaran	W.	91 55 59	2907	93 28 9	2919	95 0 4	2930	96 31 45	2941
	Pollux	W.	49 59 24	3061	51 28 21	3067	52 57 11	3072	54 25 55	3077
	Jupiter	W.	36 13 33	2960	37 44 36	2968	39 15 29	2976	40 46 12	2983
	Mars	W.	24 40 16	3212	26 6 11	3204	27 32 15	3198	28 58 26	3195
	Spica	E.	41 41 19	2905	40 9 7	2917	38 37 10	2928	37 5 27	2938
	Sun	E.	79 23 14	3279	77 58 38	3292	76 34 17	3305	75 10 11	3316
23	Pollux	W.	61 47 59	3104	63 16 4	3109	64 44 3	3114	66 11 55	3119
	Jupiter	W.	48 17 31	3018	49 47 21	3026	51 17 2	3031	52 46 36	3038
	Mars	W.	36 9 51	3195	37 36 6	3197	39 2 19	3199	40 28 29	3201
	Regulus	W.	24 46 24	3082	26 14 55	3080	27 43 29	3079	29 12 4	3080
	Sun	E.	68 12 54	3369	66 50 2	3378	65 27 21	3387	64 4 50	3395
24	Pollux	W.	73 29 56	3140	74 57 17	3143	76 24 34	3148	77 51 46	3150
	Jupiter	W.	60 12 41	3063	61 41 36	3066	63 10 27	3070	64 39 13	3074
	Mars	W.	47 38 38	3214	49 4 31	3215	50 30 22	3218	51 56 10	3219
	Regulus	W.	36 34 39	3087	38 3 4	3090	39 31 26	3092	40 59 46	3093
	Sun	E.	57 14 27	3430	55 52 45	3437	54 31 10	3442	53 9 41	3447
25	Pollux	W.	85 6 58	3162	86 33 52	3165	88 0 43	3167	89 27 32	3167
	Jupiter	W.	72 2 3	3087	73 30 29	3088	74 58 53	3090	76 27 15	3091
	Mars	W.	59 4 44	3225	60 30 23	3226	61 56 1	3226	63 21 39	3227
	Regulus	W.	48 20 56	3100	49 49 5	3101	51 17 13	3101	52 45 21	3102
	Sun	E.	46 23 35	3468	45 2 35	3471	43 41 38	3473	42 20 44	3475
26	Jupiter	W.	83 48 49	3092	85 17 8	3092	86 45 27	3091	88 13 47	3091
	Mars	W.	70 29 50	3224	71 55 31	3223	73 21 13	3221	74 46 57	3219
	Regulus	W.	60 5 57	3101	61 34 5	3100	63 2 14	3099	64 30 25	3098
	Sun	E.	35 36 47	3484	34 16 5	3485	32 55 24	3486	31 34 44	3487
27	Jupiter	W.	95 35 49	3083	97 4 20	3081	98 32 53	3078	100 1 29	3075
	Mars	W.	81 56 10	3209	83 22 9	3206	84 48 11	3203	86 14 17	3200
	Regulus	W.	71 51 47	3089	73 20 10	3087	74 48 36	3083	76 17 6	3081
	Sun	E.	24 51 41	3493	23 31 9	3494	22 10 38	3497	20 50 10	3499

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19	α Arietis	W.	93° 23′ 20″	2665	95° 0′ 47″	2683	96° 37′ 49″	2702	98° 14′ 26″	2720
	Saturn	W.	61 7 45	2569	62 47 23	2587	64 26 36	2605	66 5 24	2623
	Aldebaran	W.	60 7 2	2599	61 45 58	2617	63 24 30	2635	65 2 38	2652
	Spica	E.	73 31 27	2595	71 52 25	2613	70 13 48	2632	68 35 36	2649
	Sun	E.	108 41 16	2942	107 9 50	2962	105 38 50	2981	104 8 14	3001
20	Saturn	W.	74 13 34	2707	75 50 5	2723	77 26 14	2739	79 2 2	2754
	Aldebaran	W.	73 7 24	2738	74 43 14	2753	76 18 43	2769	77 53 51	2785
	Pollux	W.	32 9 2	3069	33 37 50	3057	35 6 52	3050	36 36 3	3045
	Spica	E.	60 30 29	2724	58 54 35	2751	57 19 3	2766	55 43 51	2782
	Sun	E.	96 41 7	3093	95 12 49	3111	93 44 53	3128	92 17 18	3145
21	Saturn	W.	86 56 11	2825	88 30 6	2838	90 3 44	2851	91 37 6	2863
	Aldebaran	W.	85 44 39	2857	87 17 53	2869	88 50 51	2882	90 23 33	2894
	Pollux	W.	44 2 44	3046	45 32 0	3048	47 1 13	3052	48 30 21	3056
	Jupiter	W.	30 7 53	2933	31 39 30	2938	33 11 0	2946	34 42 22	2953
	Spica	E.	47 52 48	2855	46 19 31	2868	44 46 31	2880	43 13 47	2893
	Sun	E.	85 4 17	3224	83 38 36	3238	82 13 12	3253	80 48 5	3266
22	Aldebaran	W.	98 3 12	2951	99 34 26	2961	101 5 28	2970	102 36 18	2979
	Pollux	W.	55 54 33	3082	57 23 4	3087	58 51 29	3093	60 19 47	3098
	Jupiter	W.	42 16 46	2990	43 47 11	2998	45 17 26	3005	46 47 33	3012
	Mars	W.	30 24 41	3193	31 50 58	3193	33 17 16	3193	34 43 34	3193
	Spica	E.	35 33 57	2950	34 2 41	2960	32 31 38	2970	31 0 48	2979
	Sun	E.	73 46 18	3328	72 22 39	3338	70 59 12	3349	69 35 57	3359
23	Pollux	W.	67 39 42	3124	69 7 23	3128	70 34 59	3132	72 2 30	3136
	Jupiter	W.	54 16 2	3043	55 45 21	3048	57 14 34	3054	58 43 40	3058
	Mars	W.	41 54 37	3203	43 20 42	3207	44 46 43	3209	46 12 42	3211
	Regulus	W.	30 40 38	3081	32 9 11	3082	33 37 43	3084	35 6 12	3086
	Sun	E.	62 42 28	3404	61 20 16	3411	59 58 12	3418	58 36 16	3424
24	Pollux	W.	79 18 55	3152	80 46 1	3156	82 13 3	3158	83 40 2	3161
	Jupiter	W.	66 7 54	3078	67 36 31	3080	69 5 5	3083	70 33 35	3085
	Mars	W.	53 21 56	3221	54 47 40	3222	56 13 23	3224	57 39 4	3225
	Regulus	W.	42 28 4	3005	43 56 20	3096	45 24 34	3098	46 52 46	3100
	Sun	E.	51 48 18	3452	50 27 0	3456	49 5 47	3461	47 44 39	3464
25	Pollux	W.	90 54 20	3168	92 21 7	3170	93 47 52	3172	95 14 35	3172
	Jupiter	W.	77 55 35	3092	79 23 54	3092	80 52 13	3093	82 20 31	3093
	Mars	W.	64 47 16	3227	66 12 53	3226	67 38 31	3225	69 4 10	3225
	Regulus	W.	54 13 28	3102	55 41 35	3102	57 9 42	3102	58 37 49	3101
	Sun	E.	40 59 52	3478	39 39 3	3479	38 18 16	3481	36 57 31	3482
26	Jupiter	W.	89 42 8	3089	91 10 31	3088	92 38 55	3087	94 7 21	3085
	Mars	W.	76 12 43	3218	77 38 31	3216	79 4 21	3214	80 30 14	3211
	Regulus	W.	65 58 37	3096	67 26 51	3095	68 55 7	3092	70 23 26	3091
	Sun	E.	30 14 5	3488	28 53 27	3488	27 32 50	3490	26 12 15	3491
27	Jupiter	W.	101 30 9	3073	102 58 52	3070	104 27 38	3068	105 56 27	3065
	Mars	W.	87 40 26	3197	89 6 39	3193	90 32 56	3190	91 59 17	3187
	Regulus	W.	77 45 40	3078	79 14 17	3074	80 42 58	3071	82 11 43	3069
	Sun	E.	19 29 45	3504	18 9 25	3510	16 49 12	3518	15 29 8	3529

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	16 29 6.86	10.801	S.21 48 31.3	−23.38	16 15.91	70.28	10 51.49	0.942
Sun.	2	16 33 26.40	10.828	21 57 40.3	22.33	16 16.06	70.37	10 28.56	0.969
Mon.	3	16 37 46.55	10.853	22 6 23.8	21.26	16 16.21	70.45	10 5.04	0.993
Tues.	4	16 42 7.30	10.877	22 14 41.8	−20.20	16 16.35	70.53	9 40.91	1.017
Wed.	5	16 46 28.62	10.900	22 22 33.8	19.11	16 16.49	70.62	9 16.21	1.040
Thur.	6	16 50 50.45	10.921	22 29 59.7	18.01	16 16.63	70.69	8 51.00	1.061
Frid.	7	16 55 12.78	10.941	22 36 59.2	−16.91	16 16.76	70.76	8 25.30	1.081
Sat.	8	16 59 35.61	10.960	22 43 32.1	15.81	16 16.89	70.83	7 59.11	1.100
Sun.	9	17 3 58.89	10.978	22 49 38.2	14.69	16 17.01	70.89	7 32.45	1.118
Mon.	10	17 8 22.58	10.996	22 55 17.3	−13.56	16 17.14	70.95	7 5.38	1.136
Tues.	11	17 12 46.67	11.012	23 0 29 1	12.42	16 17.25	71.01	6 37.93	1.152
Wed.	12	17 17 11.15	11.027	23 5 13.6	11.28	16 17.36	71.05	6 10.08	1.167
Thur.	13	17 21 35.97	11.040	23 9 30.6	−10.13	16 17.46	71.10	5 41.90	1.180
Frid.	14	17 26 1.09	11.053	23 13 20.0	8.97	16 17.56	71.14	5 13.41	1.193
Sat.	15	17 30 26.49	11.064	23 16 41.6	7.82	16 17.64	71.17	4 44.64	1.204
Sun.	16	17 34 52.18	11.074	23 19 35.1	− 6.65	16 17.72	71.20	4 15.59	1.214
Mon.	17	17 39 18.10	11.083	23 22 0.6	5.48	16 17.81	71.23	3 46.31	1.222
Tues.	18	17 43 44.21	11.092	23 23 58.0	4.30	16 17.88	71.26	3 16.83	1.231
Wed.	19	17 48 10.49	11.098	23 25 27.3	− 3.13	16 17.94	71.28	2 47.19	1.237
Thur.	20	17 52 36.92	11.103	23 26 28.5	1.95	16 18.00	71.29	2 17.41	1.242
Frid.	21	17 57 3.45	11.108	23 27 1.3	− 0.77	16 18.06	71.30	1 47.52	1.247
Sat.	22	18 1 30.07	11.110	23 27 5.7	+ 0.41	16 18.11	71.30	1 17.53	1.249
Sun.	23	18 5 56.72	11.111	23 26 41.8	1.59	16 18.15	71.30	0 47.52	1.250
Mon.	24	18 10 23.37	11.110	23 25 49.6	2.77	16 18.19	71.29	0 17.50	1.249
Tues.	25	18 14 49.99	11.109	23 24 29.1	+ 3.95	16 18.22	71.28	0 12.48	1.248
Wed.	26	18 19 16.55	11.105	23 22 40.3	5.12	16 18.26	71.27	0 42.39	1.244
Thur.	27	18 23 42.99	11.099	23 20 23.3	6.29	16 18.29	71.25	1 12.19	1.238
Frid.	28	18 28 9.29	11.093	23 17 38.2	+ 7.46	16 18.31	71.23	1 41.86	1.231
Sat.	29	18 32 35.40	11.084	23 14 25.0	8.63	16 18.33	71.20	2 11.33	1.223
Sun.	30	18 37 1.29	11.074	23 10 43.9	9.80	16 18.35	71.17	2 40.58	1.213
Mon.	31	18 41 26.92	11.062	23 6 35.0	10.96	16 18.36	71.13	3 9.57	1.201
Tues.	32	18 45 52.26	11.049	S.23 1 58.4	+12.10	16 18.37	71.09	3 38.27	1.188

Note.—The mean time of semidiameter passing may be found by subtracting $0^{s}.19$ from the sidereal time.
The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	16 29 8.81	10.799	S. 21 48 35.6	−23.37	10 51.32	0.942	16 40 0.13
Sun.	2	16 33 28.29	10.826	21 57 44.2	22.32	10 28.39	0.969	16 43 56.68
Mon.	3	16 37 48.37	10.850	22 6 27.4	21.25	10 4.87	0.993	16 47 53.24
Tues.	4	16 42 9.05	10.874	22 14 45.1	−20.19	9 40.74	1.017	16 51 49.79
Wed.	5	16 46 30.30	10.897	22 22 36.8	19.10	9 16.05	1.040	16 55 46.35
Thur.	6	16 50 52.06	10.918	22 30 2.4	18.01	8 50.85	1.061	16 59 42.91
Frid.	7	16 55 14.32	10.938	22 37 1.6	−16.90	8 25.15	1.081	17 3 39.47
Sat.	8	16 59 37.07	10.957	22 43 34.2	15.80	7 58.95	1.100	17 7 36.02
Sun.	9	17 4 0.27	10.975	22 49 40.0	14.68	7 32.31	1.118	17 11 32.58
Mon.	10	17 8 23.88	10.993	22 55 18.8	−13.55	7 5.25	1.136	17 15 29.13
Tues.	11	17 12 47.89	11.009	23 0 30.1	12.41	6 37.80	1.152	17 19 25.69
Wed.	12	17 17 12.29	11.024	23 5 14.7	11.27	6 9.96	1.167	17 23 22.25
Thur.	13	17 21 37.02	11.037	23 9 31.5	−10.12	5 41.79	1.180	17 27 18.81
Frid.	14	17 26 2.05	11.050	23 13 20.7	8.96	5 13.31	1.193	17 31 15.36
Sat.	15	17 30 27.37	11.061	23 16 42.1	7.81	4 44.55	1.204	17 35 11.92
Sun.	16	17 34 52.97	11.071	23 19 35.5	− 6.64	4 15.51	1.214	17 39 8.48
Mon.	17	17 39 18.80	11.079	23 22 0.9	5.47	3 46.24	1.223	17 43 5.04
Tues.	18	17 43 44.82	11.087	23 23 58.2	4.30	3 16.77	1.231	17 47 1.59
Wed.	19	17 48 11.01	11.094	23 25 27.4	− 3.13	2 47.14	1.237	17 50 58.15
Thur.	20	17 52 37.34	11.099	23 26 28.5	1.95	2 17.37	1.242	17 54 54.71
Frid.	21	17 57 3.78	11.104	23 27 1.3	− 0.77	1 47.49	1.247	17 58 51.27
Sat.	22	18 1 30.31	11.106	23 27 5.7	+ 0.41	1 17.52	1.249	18 2 47.82
Sun.	23	18 5 56.87	11.107	23 26 41.7	1.59	0 47.51	1.250	18 6 44.38
Mon.	24	18 10 23.43	11.106	23 25 49.5	2.77	0 17 50	1.249	18 10 40.93
Tues.	25	18 14 49.96	11.105	23 24 29.1	+ 3.95	0 12.47	1.248	18 14 37.49
Wed.	26	18 19 16.42	11.101	23 22 40.4	5.12	0 42.37	1.244	18 18 34.05
Thur.	27	18 23 42.77	11.095	23 20 23.5	6.29	1 12.16	1.238	18 22 30.61
Frid.	28	18 28 8.98	11.089	23 17 38.5	+ 7.46	1 41.82	1.231	18 26 27.16
Sat.	29	18 32 35.00	11.080	23 14 25.4	8.63	2 11.28	1.223	18 30 23.72
Sun.	30	18 37 0.80	11.070	23 10 44.4	9.80	2 40.52	1.213	18 34 20.28
Mon.	31	18 41 26.34	11.058	23 6 35.6	10.95	3 9.50	1.201	18 38 16.84
Tues.	32	18 45 51.59	11.045	S. 23 1 59.1	+12.09	3 38.20	1.188	18 42 13.39

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour,
+ $9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	335	248 59 55.5	59 1.3	152.20	+ 0.29	9.9937677	− 28.6	7 18 47.79
2	336	249 60 48.6	59 54.3	152.24	0.34	9.9936998	28.0	7 14 51.88
3	337	251 1 42.7	0 48.3	152.28	0.35	9.9936333	27.4	7 10 55.97
4	338	252 2 37.7	1 43.1	152.31	+ 0.34	9.9935684	− 26.7	7 7 0.06
5	339	253 3 33.4	2 38.6	152.34	0.28	9.9935051	26.0	7 3 4.14
6	340	254 4 29.8	3 34.8	152.37	0.22	9.9934436	25.2	6 59 8.23
7	341	255 5 26.9	4 31.8	152.40	+ 0.13	9.9933841	− 24.4	6 55 12.32
8	342	256 6 24.6	5 29.4	152.42	+ 0.02	9.9933267	23.5	6 51 16.41
9	343	257 7 23.0	6 27.6	152.45	− 0.10	9.9932715	22.5	6 47 20.50
10	344	258 8 22.0	7 26.4	152.47	− 0.23	9.9932187	− 21.5	6 43 24.59
11	345	259 9 21.7	8 25.9	152.49	0.36	9.9931684	20.5	6 39 28.68
12	346	260 10 22.0	9 26.1	152.51	0.49	9.9931206	19.4	6 35 32.77
13	347	261 11 22.9	10 26.9	152.53	− 0.59	9.9930754	− 18.3	6 31 36.86
14	348	262 12 24.4	11 28.2	152 56	0.68	9.9930329	17.1	6 27 40.95
15	349	263 13 26.6	12 30.2	152.59	0.74	9.9929932	16.0	6 23 45.04
16	350	264 14 29.6	13 33.0	152.63	− 0.76	9.9929563	− 14.8	6 19 49.13
17	351	265 15 33.3	14 36.6	152.66	0.76	9.9929221	13.7	6 15 53.22
18	352	266 16 37.8	15 41.0	152.70	0.73	9.9928905	12.6	6 11 57.31
19	353	267 17 43.1	16 46.1	152.73	− 0.65	9.9928614	− 11.5	6 8 1.39
20	354	268 18 49.2	17 52.0	152.76	0.57	9.9928349	10.5	6 4 5.48
21	355	269 19 56.0	18 58.6	152.79	0.45	9.9928108	9.5	6 0 9.57
22	356	270 21 3.5	20 6.0	152.82	− 0.33	9.9927889	− 8.5	5 56 13.66
23	357	271 22 11.7	21 14.0	152.85	0.20	9.9927692	7.7	5 52 17.75
24	358	272 23 20.5	22 22.6	152.88	− 0.07	9.9927514	7.0	5 48 21.84
25	359	273 24 30.0	23 31.9	152.90	+ 0.07	9.9927355	− 6.2	5 44 25.92
26	360	274 25 40.0	24 41.7	152.92	0.20	9.9927215	5.5	5 40 30.01
27	361	275 26 50.4	25 52.0	152.94	0.31	9.9927092	4.8	5 36 34.09
28	362	276 28 1.1	27 2.6	152.95	+ 0.38	9.9926987	− 4.1	5 32 38.18
29	363	277 29 12.0	28 13.3	152.96	0.44	9.9926898	3.4	5 28 42.28
30	364	278 30 23.1	29 24.2	152.96	0.46	9.9926825	2.7	5 24 46.36
31	365	279 31 34.2	30 35.1	152.96	0.46	9.9926770	2.0	5 20 50.45
32	366	280 32 45.2	31 46.0	152.96	+ 0.42	9.9926733	− 1.2	5 16 54.54

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 58.6	15 1.7	54 51.1	+ 0.89	55 2.3	+ 0.97	1 14.0	2.06	1.7
2	15 5.0	15 8.6	55 14.5	1.06	55 27.8	1.15	2 3.6	2.06	2.7
3	15 12.5	15 16.7	55 42.1	1.23	55 57.5	1.32	2 53.0	2.05	3.7
4	15 21.2	15 26.0	56 13.9	+ 1.42	56 31.5	+ 1.51	3 42.0	2.03	4.7
5	15 31.0	15 36.4	56 50.1	1.59	57 9.7	1.67	4 30.6	2.02	5.7
6	15 42.0	15 47.7	57 30.2	1.73	57 51.4	1.78	5 19.2	2.03	6.7
7	15 53.6	15 59.6	58 13.1	+ 1.82	58 35.1	+ 1.83	6 8.3	2.07	7.7
8	16 5.6	16 11.4	58 57.0	1.81	59 18.4	1.74	6 58.7	2.14	8.7
9	16 17.0	16 22.1	59 38.8	1.63	59 57.6	1.48	7 51.2	2.24	9.7
10	16 26.7	16 30.5	60 14.4	+ 1.29	60 28.6	+ 1.05	8 46.3	2.36	10.7
11	16 33.5	16 35.5	60 39.6	0.77	60 47.0	+ 0.46	9 44.3	2.48	11.7
12	16 36.5	16 36.2	60 50.5	+ 0.11	60 49.6	− 0.26	10 44.9	2.56	12.7
13	16 34.8	16 32.3	60 44.4	− 0.61	60 35.0	− 0.96	11 46.6	2.57	13.7
14	16 28.5	16 23.8	60 21.3	1.29	60 4.0	1.57	12 47.6	2.50	14.7
15	16 18.2	16 11.8	59 43.4	1.83	59 20.0	2.03	13 46.2	2.37	15.7
16	16 4.9	15 57.6	58 54.6	− 2.17	58 27.8	− 2.26	14 41.3	2.21	16.7
17	15 50.1	15 42.5	58 0.1	2.31	57 32.4	2.29	15 32.8	2.07	17.7
18	15 35.1	15 27.9	57 5.0	2.24	56 38.6	2.15	16 20.9	1.94	18.7
19	15 21.1	15 14.7	56 13.5	− 2.02	55 50.2	− 1.86	17 6.5	1.86	19.7
20	15 8.9	15 3.7	55 28.8	1.68	55 9.8	1.48	17 50.4	1.81	20.7
21	14 59.2	14 55.3	54 53.1	1.29	54 38.9	1.08	18 33.5	1.79	21.7
22	14 52.1	14 49.7	54 27.2	− 0.87	54 18.2	− 0.65	19 16.6	1.81	22.7
23	14 47.9	14 46.8	54 11.6	0.44	54 7.6	− 0.23	20 0.3	1.85	23.7
24	14 46.3	14 46.5	54 5.9	− 0.05	54 6.4	+ 0.12	20 45.3	1.90	24.7
25	14 47.2	14 48.4	54 9.0	+ 0.30	54 13.6	+ 0.45	21 31.7	1.97	25.7
26	14 50.1	14 52.3	54 19.9	0.59	54 27.8	0.72	22 19.7	2.03	26.7
27	14 54.8	14 57.7	54 37.1	0.82	54 47.5	0.91	23 9.0	2.07	27.7
28	15 0.8	15 4.1	54 59.0	+ 0.99	55 11.2	+ 1.04	23 59.1	2.09	28.7
29	15 7.6	15 11.3	55 24.1	1.10	55 37.6	1.14	δ		0.0
30	15 15.0	15 18.9	55 51.4	1.17	56 5.5	1.18	0 49.3	2.09	1.0
31	15 22.8	15 26.7	56 19.8	1.19	56 34.2	1.20	1 39.3	2.07	2.0
32	15 30.7	15 34.6	56 48.7	+ 1.21	57 3.3	+ 1.22	2 28.7	2.04	3.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 51 33.79	2.1554	S. 19 7 58.8	1.087
1	17 53 43.13	2.1559	19 6 50.7	1.182
2	17 55 52.50	2.1565	19 5 37.0	1.276
3	17 58 1.91	2.1570	19 4 17.6	1.371
4	18 0 11.34	2.1574	19 2 52.5	1.465
5	18 2 20.80	2.1579	19 1 21.8	1.559
6	18 4 30.29	2.1583	18 59 45.4	1.653
7	18 6 39.80	2.1586	18 58 3.4	1.747
8	18 8 49.33	2.1589	18 56 15.7	1.842
9	18 10 58.87	2.1592	18 54 22.3	1.937
10	18 13 8.43	2.1595	18 52 23.3	2.031
11	18 15 18.01	2.1597	18 50 18.6	2.125
12	18 17 27.60	2.1599	18 48 8.3	2.219
13	18 19 37.20	2.1601	18 45 52.3	2.313
14	18 21 46.81	2.1602	18 43 30.7	2.407
15	18 23 56.42	2.1603	18 41 3.5	2.500
16	18 26 6.04	2.1604	18 38 30.7	2.594
17	18 28 15.67	2.1605	18 35 52.2	2.688
18	18 30 25.30	2.1605	18 33 8.1	2.782
19	18 32 34.93	2.1605	18 30 18.4	2.875
20	18 34 44.56	2.1604	18 27 23.1	2.968
21	18 36 54.18	2.1603	18 24 22.2	3.061
22	18 39 3.80	2.1602	18 21 15.8	3.154
23	18 41 13.41	2.1601	S. 18 18 3.8	3.247

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 43 23.01	2.1599	S. 18 14 46.2	3.339
1	18 45 32.60	2.1597	18 11 23.1	3.431
2	18 47 42.18	2.1596	18 7 54.5	3.523
3	18 49 51.75	2.1593	18 4 20.3	3.616
4	18 52 1.30	2.1591	18 0 40.6	3.707
5	18 54 10.84	2.1588	17 56 55.4	3.798
6	18 56 20.36	2.1585	17 53 4.8	3.889
7	18 58 29.86	2.1582	17 49 8.7	3.981
8	19 0 39.34	2.1578	17 45 7.1	4.072
9	19 2 48.80	2.1574	17 41 0.1	4.162
10	19 4 58.23	2.1570	17 36 47.7	4.252
11	19 7 7.64	2.1567	17 32 29.9	4.342
12	19 9 17.03	2.1562	17 28 6.6	4.432
13	19 11 26.39	2.1557	17 23 38.0	4.522
14	19 13 35.72	2.1552	17 19 4.0	4.611
15	19 15 45.02	2.1548	17 14 24.7	4.699
16	19 17 54.30	2.1543	17 9 40.1	4.787
17	19 20 3.54	2.1537	17 4 50.2	4.876
18	19 22 12.75	2.1532	16 59 55.0	4.964
19	19 24 21.93	2.1527	16 54 54.5	5.051
20	19 26 31.07	2.1521	16 49 48.8	5.138
21	19 28 40.18	2.1515	16 44 37.9	5.225
22	19 30 49.25	2.1509	16 39 21.8	5.312
23	19 32 58.29	2.1503	16 34 0.5	5.398
24	19 35 7.29	2.1497	S. 16 28 34.0	5.484

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 35 7.29	2.1497	S. 16 28 34.0	5.484
1	19 37 16.25	2.1490	16 23 2.4	5.569
2	19 39 25.17	2.1484	16 17 25.7	5.654
3	19 41 34.06	2.1478	16 11 43.9	5.739
4	19 43 42.91	2.1472	16 5 57.0	5.823
5	19 45 51.72	2.1464	16 0 5.1	5.907
6	19 48 0.48	2.1457	15 54 8.2	5.990
7	19 50 9.20	2.1450	15 48 6.3	6.074
8	19 52 17.88	2.1444	15 41 59.4	6.157
9	19 54 26.53	2.1438	15 35 47.5	6.239
10	19 56 35.14	2.1431	15 29 30.7	6.320
11	19 58 43.70	2.1423	15 23 9.1	6.401
12	20 0 52.22	2.1417	15 16 42.6	6.482
13	20 3 0.70	2.1410	15 10 11.2	6.563
14	20 5 9.14	2.1402	15 3 35.0	6.643
15	20 7 17.53	2.1395	14 56 54.1	6.722
16	20 9 25.88	2.1388	14 50 8.4	6.801
17	20 11 34.19	2.1382	14 43 18.0	6.879
18	20 13 42.46	2.1375	14 36 22.9	6.958
19	20 15 50.69	2.1367	14 29 23.1	7.036
20	20 17 58.87	2.1360	14 22 18.6	7.113
21	20 20 7.01	2.1354	14 15 9.5	7.189
22	20 22 15.12	2.1347	14 7 55.9	7.265
23	20 24 23.18	2.1340	S. 14 0 37.7	7.341

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 26 31.20	2.1333	S. 13 53 15.0	7.416
1	20 28 39.18	2.1327	13 45 47.8	7.491
2	20 30 47.12	2.1321	13 38 16.1	7.565
3	20 32 55.03	2.1315	13 30 40.0	7.638
4	20 35 2.90	2.1308	13 22 59.5	7.711
5	20 37 10.73	2.1302	13 15 14.7	7.784
6	20 39 18.53	2.1296	13 7 25.5	7.856
7	20 41 26.29	2.1290	12 59 32.0	7.927
8	20 43 34.01	2.1284	12 51 34.3	7.998
9	20 45 41.70	2.1279	12 43 32.3	8.068
10	20 47 49.36	2.1274	12 35 26.1	8.137
11	20 49 56.99	2.1268	12 27 15.8	8.206
12	20 52 4.58	2.1263	12 19 1.4	8.275
13	20 54 12.14	2.1258	12 10 42.8	8.343
14	20 56 19.68	2.1254	12 2 20.2	8.410
15	20 58 27.19	2.1249	11 53 53.6	8.477
16	21 0 34.67	2.1244	11 45 23.0	8.543
17	21 2 42.12	2.1240	11 36 48.4	8.609
18	21 4 49.55	2.1236	11 28 9.9	8.674
19	21 6 56.96	2.1232	11 19 27.5	8.738
20	21 9 4.34	2.1228	11 10 41.3	8.802
21	21 11 11.70	2.1226	11 1 51.3	8.865
22	21 13 19.05	2.1223	10 52 57.5	8.927
23	21 15 26.38	2.1220	10 44 0.0	8.990
24	21 17 33.69	2.1218	S. 10 34 58.7	9.052

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 5.					**FRIDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 17 33.69	2.1218	S. 10 34 58.7	9.052	0	22 59 45.14	2.1517	S. 2 23 11.4	11.148
1	21 19 40.99	2.1216	10 25 53.8	9.112	1	23 1 54.29	2.1533	2 12 1.8	11.172
2	21 21 48.28	2.1213	10 16 45.3	9.172	2	23 4 3.54	2.1550	2 0 50.8	11.194
3	21 23 55.55	2.1211	10 7 33.2	9.231	3	23 6 12.89	2.1568	1 49 38.5	11.216
4	21 26 2.81	2.1210	9 58 17.6	9.289	4	23 8 22.35	2.1587	1 38 24.9	11.237
5	21 28 10.07	2.1209	9 48 58.5	9.347	5	23 10 31.93	2.1607	1 27 10.1	11.257
6	21 30 17.32	2.1208	9 39 35.9	9.405	6	23 12 41.63	2.1627	1 15 54.1	11.276
7	21 32 24.57	2.1208	9 30 9.9	9.462	7	23 14 51.45	2.1646	1 4 37.0	11.294
8	21 34 31.82	2.1207	9 20 40.5	9.517	8	23 17 1.38	2.1665	0 53 18.8	11.312
9	21 36 39.06	2.1207	9 11 7.8	9.572	9	23 19 11.43	2.1686	0 41 59.6	11.328
10	21 38 46.30	2.1208	9 1 31.8	9.627	10	23 21 21.61	2.1708	0 30 39.4	11.344
11	21 40 53.55	2.1209	8 51 52.5	9.682	11	23 23 31.93	2.1731	0 19 13.3	11.358
12	21 43 0.81	2.1211	8 42 10.0	9.735	12	23 25 42.38	2.1753	S. 0 7 56.4	11.371
13	21 45 8.08	2.1212	8 32 24.3	9.787	13	23 27 52.97	2.1776	N. 0 3 26.2	11.383
14	21 47 15.35	2.1213	8 22 35.5	9.839	14	23 30 3.70	2.1799	0 14 49.6	11.395
15	21 49 22.63	2.1215	8 12 43.6	9.891	15	23 32 14.56	2.1823	0 26 13.6	11.405
16	21 51 29.93	2.1217	8 2 48.6	9.941	16	23 34 25.57	2.1847	0 37 38.2	11.414
17	21 53 37.24	2.1220	7 52 50.7	9.990	17	23 36 36.73	2.1872	0 49 3.3	11.422
18	21 55 44.57	2.1223	7 42 49.8	10.039	18	23 38 48.04	2.1898	1 0 28.9	11.430
19	21 57 51.92	2.1227	7 32 46.0	10.088	19	23 40 59.51	2.1925	1 11 54.9	11.436
20	21 59 59.29	2.1231	7 22 39.3	10.136	20	23 43 11.14	2.1952	1 23 21.2	11.441
21	22 2 6.69	2.1236	7 12 29.7	10.182	21	23 45 22.93	2.1978	1 34 47.8	11.445
22	22 4 14.12	2.1241	7 2 17.4	10.228	22	23 47 34.88	2.2005	1 46 14.6	11.448
23	22 6 21.58	2.1246	S. 6 52 2.3	10.274	23	23 49 46.99	2.2033	N. 1 57 41.6	11.450
	THURSDAY 6.					**SATURDAY 8.**			
0	22 8 29.07	2.1251	S. 6 41 44.5	10.319	0	23 51 59.27	2.2062	N. 2 9 8.6	11.450
1	22 10 36.59	2,1257	6 31 24.0	10.362	1	23 54 11.73	2.2092	2 20 35.6	11.450
2	22 12 44.15	2.1263	6 21 1.0	10.405	2	23 56 24.37	2.2121	2 32 2.6	11.449
3	22 14 51.75	2.1270	6 10 35.4	10.447	3	23 58 37.18	2.2151	2 43 29.5	11.447
4	22 16 59.39	2.1277	6 0 7.3	10.489	4	0 0 50.18	2.2182	2 54 56.2	11.443
5	22 19 7.08	2.1285	5 49 36.7	10.530	5	0 3 3.36	2.2213	3 6 22.6	11.438
6	22 21 14.81	2.1293	5 39 3.7	10.570	6	0 5 16.73	2.2244	3 17 48.7	11.432
7	22 23 22.59	2.1302	5 28 28.3	10.609	7	0 7 30.29	2.2276	3 29 14.4	11.425
8	22 25 30.43	2.1311	5 17 50.6	10.647	8	0 9 44.04	2.2308	3 40 39.7	11.417
9	22 27 38.32	2.1320	5 7 10.6	10.685	9	0 11 57.99	2.2341	3 52 4.4	11.407
10	22 29 46.27	2.1330	4 56 28.4	10.722	10	0 14 12.14	2.2375	4 3 28.5	11.396
11	22 31 54.28	2.1340	4 45 44.0	10.757	11	0 16 26.49	2.2409	4 14 51.9	11.384
12	22 34 2.35	2.1351	4 34 57.5	10.792	12	0 18 41.05	2.2443	4 26 14.6	11.372
13	22 36 10.49	2.1362	4 24 8.9	10.827	13	0 20 55.81	2.2478	4 37 36.5	11.358
14	22 38 18.70	2.1373	4 13 18.2	10.861	14	0 23 10.79	2.2514	4 48 57.5	11.342
15	22 40 26.97	2.1385	4 2 25.6	10.893	15	0 25 25.98	2.2549	5 0 17.5	11.325
16	22 42 35.32	2.1398	3 51 31.1	10.924	16	0 27 41.38	2.2585	5 11 36.5	11.307
17	22 44 43.75	2.1412	3 40 34.7	10.956	17	0 29 57.00	2.2622	5 22 54.4	11.288
18	22 46 52.26	2.1425	3 29 36.4	10.987	18	0 32 12.85	2.2660	5 34 11.1	11.268
19	22 49 0.85	2.1439	3 18 36.3	11.016	19	0 34 28.92	2.2697	5 45 26.6	11.247
20	22 51 9.53	2.1453	3 7 34.5	11.043	20	0 36 45.22	2.2735	5 56 40.7	11.223
21	22 53 18.29	2.1468	2 56 31.1	11.070	21	0 39 1.74	2.2773	6 7 53.4	11.199
22	22 55 27.14	2.1483	2 45 26.1	11.097	22	0 41 18.49	2.2812	6 19 4.6	11.174
23	22 57 36.09	2.1500	2 34 19.5	11.123	23	0 43 35.48	2.2851	6 30 14.2	11.147
24	22 59 45.14	2.1517	S. 2 23 11.4	11.148	24	0 45 52.70	2.2890	N. 6 41 22.2	11.119

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 9.					TUESDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 45 52.70	2.2890	N. 6 41 22.2	11.119	0	2 40 47.87	2.5025	N.14 36 48.1	8.148
1	0 48 10.16	2.2930	6 52 28.5	11.090	1	2 43 18.15	2.5068	14 44 54.1	8.052
2	0 50 27.86	2.2971	7 3 33.0	11.059	2	2 45 48.69	2.5112	14 52 54.3	7.954
3	0 52 45.81	2.3012	7 14 35.6	11.027	3	2 48 19.49	2.5154	15 0 48.6	7.855
4	0 55 4.00	2.3053	7 25 36.3	10.994	4	2 50 50.54	2.5196	15 8 36.9	7.754
5	0 57 22.44	2.3094	7 36 34.9	10.959	5	2 53 21.84	2.5237	15 16 19.1	7.652
6	0 59 41.13	2.3136	7 47 31.4	10.923	6	2 55 53.38	2.5278	15 23 55.2	7.550
7	1 2 0.07	2.3178	7 58 25.7	10.887	7	2 58 25.17	2.5318	15 31 25.1	7.446
8	1 4 19.26	2.3220	8 9 17.8	10.848	8	3 0 57.20	2.5359	15 38 48.7	7.340
9	1 6 38.71	2.3263	8 20 7.5	10.808	9	3 3 29.48	2.5399	15 46 5.9	7.232
10	1 8 58.42	2.3306	8 30 54.8	10.767	10	3 6 1.99	2.5438	15 53 16.6	7.124
11	1 11 18.38	2.3349	8 41 39.5	10.723	11	3 8 34.73	2.5476	16 0 20.8	7.015
12	1 13 38.60	2.3393	8 52 21.6	10.679	12	3 11 7.70	2.5514	16 7 18.4	6.905
13	1 15 59.09	2.3437	9 3 1.0	10.634	13	3 13 40.90	2.5552	16 14 9.4	6.793
14	1 18 19.84	2.3480	9 13 37.7	10.587	14	3 16 14.32	2.5588	16 20 53.6	6.680
15	1 20 40.85	2.3524	9 24 11.5	10.539	15	3 18 47.95	2.5623	16 27 31.0	6.566
16	1 23 2.13	2.3569	9 34 42.4	10.490	16	3 21 21.80	2.5659	16 34 1.5	6.451
17	1 25 23.68	2.3614	9 45 10.3	10.438	17	3 23 55.86	2.5694	16 40 25.1	6.334
18	1 27 45.50	2.3659	9 55 35.0	10.385	18	3 26 30.13	2.5728	16 46 41.5	6.216
19	1 30 7.59	2.3704	10 5 56.5	10.332	19	3 29 4.60	2.5761	16 52 51.0	6.097
20	1 32 29.95	2.3749	10 16 14.8	10.277	20	3 31 39.26	2.5793	16 58 53.3	5.978
21	1 34 52.58	2.3795	10 26 29.7	10.220	21	3 34 14.11	2.5824	17 4 48.4	5.857
22	1 37 15.49	2.3841	10 36 41.2	10.162	22	3 36 49.15	2.5856	17 10 36.2	5.736
23	1 39 38.67	2.3887	N.10 46 49.1	10.102	23	3 39 24.38	2.5887	N.17 16 16.7	5.613
	MONDAY 10.					WEDNESDAY 12.			
0	1 42 2.13	2.3933	N.10 56 53.4	10.041	0	3 41 59.79	2.5916	N.17 21 49.8	5.489
1	1 44 25.86	2.3979	11 6 54.0	9.978	1	3 44 35.37	2.5944	17 27 15.4	5.364
2	1 46 49.87	2.4025	11 16 50.8	9.915	2	3 47 11.12	2.5972	17 32 33.5	5.238
3	1 49 14.16	2.4071	11 26 43.8	9.850	3	3 49 47.03	2.5998	17 37 44.0	5.112
4	1 51 38.72	2.4117	11 36 32.8	9.782	4	3 52 23.09	2.6023	17 42 46.9	4.985
5	1 54 3.56	2.4163	11 46 17.7	9.713	5	3 54 59.30	2.6048	17 47 42.2	4.857
6	1 56 28.68	2.4210	11 55 58.4	9.643	6	3 57 35.66	2.6072	17 52 29.8	4.728
7	1 58 54.08	2.4257	12 5 34.9	9.573	7	4 0 12.16	2.6094	17 57 9.6	4.598
8	2 1 19.76	2.4303	12 15 7.2	9.502	8	4 2 48.79	2.6116	18 1 41.5	4.467
9	2 3 45.71	2.4349	12 24 35.1	9.428	9	4 5 25.55	2.6137	18 6 5.6	4.336
10	2 6 11.94	2.4395	12 33 58.5	9.353	10	4 8 2.43	2.6157	18 10 21.8	4.203
11	2 8 38.45	2.4441	12 43 17.4	9.276	11	4 10 39.43	2.6176	18 14 30.0	4.070
12	2 11 5.23	2.4487	12 52 31.6	9.197	12	4 13 16.54	2.6193	18 18 30.2	3.937
13	2 13 32.29	2.4532	13 1 41.1	9.117	13	4 15 53.75	2.6210	18 22 22.4	3.802
14	2 15 59.62	2.4578	13 10 45.7	9.036	14	4 18 31.06	2.6226	18 26 6.5	3.667
15	2 18 27.23	2.4024	13 19 45.4	8.953	15	4 21 8.46	2.6240	18 29 42.4	3.531
16	2 20 55.11	2.4670	13 28 40.1	8.870	16	4 23 45.94	2.6253	18 33 10.2	3.396
17	2 23 23.27	2.4716	13 37 29.8	8.785	17	4 26 23.50	2.6266	18 36 29.9	3.260
18	2 25 51.70	2.4761	13 46 14.3	8.698	18	4 29 1.13	2.6277	18 39 41.4	3.122
19	2 28 20.40	2.4805	13 54 53.5	8.609	19	4 31 38.83	2.6287	18 42 44.6	2.984
20	2 30 49.36	2.4849	14 3 27.4	8.520	20	4 34 16.58	2.6296	18 45 39.5	2.847
21	2 33 18.59	2.4894	14 11 55.9	8.429	21	4 36 54.38	2.6304	18 48 26.2	2.709
22	2 35 48.09	2.4938	14 20 18.9	8.337	22	4 39 32.23	2.6311	18 51 4.6	2.570
23	2 38 17.85	2.4982	14 28 36.3	8.243	23	4 42 10.11	2.6316	18 53 34.6	2.430
24	2 40 47.87	2.5025	N.14 36 48.1	8.148	24	4 44 48.02	2.6320	N.18 55 56.2	2.290

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 44 48.02	2.6320	N.18 55 56.2	2.290
1	4 47 25.95	2.6323	18 58 9.4	2.151
2	4 50 3.90	2.6326	19 0 14.3	2.012
3	4 52 41.86	2.6327	19 2 10.8	1.872
4	4 55 19.82	2.6326	19 3 58.9	1.732
5	4 57 57.77	2.6324	19 5 38.6	1.591
6	5 0 35.71	2.6322	19 7 9.8	1.450
7	5 3 13.63	2.6318	19 8 32.6	1.310
8	5 5 51.52	2.6313	19 9 47.0	1.169
9	5 8 29.38	2.6307	19 10 52.9	1.028
10	5 11 7.20	2.6299	19 11 50.4	0.888
11	5 13 44.97	2.6289	19 12 39.5	0.747
12	5 16 22.67	2.6278	19 13 20.1	0.607
13	5 19 0.31	2.6267	19 13 52.3	0.467
14	5 21 37.88	2.6256	19 14 16.1	0.326
15	5 24 15.38	2.6243	19 14 31.4	0.186
16	5 26 52.79	2.6228	19 14 38.4	+ 0.047
17	5 29 30.11	2.6212	19 14 37.0	− 0.093
18	5 32 7.33	2.6194	19 14 27.2	0.232
19	5 34 44.44	2.6176	19 14 9.1	0.372
20	5 37 21.44	2.6157	19 13 42.6	0.511
21	5 39 58.32	2.6136	19 13 7.8	0.649
22	5 42 35.07	2.6114	19 12 24.7	0.787
23	5 45 11.69	2.6091	N.19 11 33.4	0.924

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 47 48.16	2.6066	N.19 10 33.8	1.062
1	5 50 24.48	2.6042	19 9 26.0	1.198
2	5 53 0.66	2.6017	19 8 10.0	1.334
3	5 55 36.68	2.5989	19 6 45.9	1.469
4	5 58 12.53	2.5960	19 5 13.7	1.604
5	6 0 48.20	2.5930	19 3 33.4	1.739
6	6 3 23.69	2.5899	19 1 45.0	1.873
7	6 5 58.99	2.5868	18 59 48.6	2.006
8	6 8 34.11	2.5837	18 57 44.3	2.137
9	6 11 9.03	2.5803	18 55 32.1	2.269
10	6 13 43.75	2.5768	18 53 12.0	2.400
11	6 16 18.25	2.5732	18 50 44.1	2.531
12	6 18 52.53	2.5695	18 48 8.3	2.661
13	6 21 26.59	2.5658	18 45 24.8	2.789
14	6 24 0.43	2.5620	18 42 33.6	2.916
15	6 26 34.03	2.5580	18 39 34.8	3.043
16	6 29 7.39	2.5540	18 36 28.4	3.170
17	6 31 40.51	2.5500	18 33 14.4	3.296
18	6 34 13.39	2.5458	18 29 52.9	3.420
19	6 36 46.01	2.5415	18 26 24.0	3.543
20	6 39 18.37	2.5372	18 22 47.7	3.666
21	6 41 50.47	2.5327	18 19 4.1	3.787
22	6 44 22.30	2.5282	18 15 13.3	3.907
23	6 46 53.85	2.5236	18 11 15.3	4.026
24	6 49 25.13	2.5190	N.18 7 10.2	4.144

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 49 25.13	2.5190	N.18 7 10.2	4.144
1	6 51 56.13	2.5142	18 2 58.0	4.262
2	6 54 26.84	2.5094	17 58 38.7	4.379
3	6 56 57.26	2.5046	17 54 12.5	4.494
4	6 59 27.39	2.4997	17 49 39.4	4.608
5	7 1 57.22	2.4947	17 44 59.5	4.722
6	7 4 26.75	2.4896	17 40 12.8	4.834
7	7 6 55.97	2.4845	17 35 19.4	4.944
8	7 9 24.89	2.4794	17 30 19.5	5.053
9	7 11 53.50	2.4742	17 25 13.0	5.162
10	7 14 21.79	2.4689	17 20 0.0	5.270
11	7 16 49.77	2.4636	17 14 40.6	5.377
12	7 19 17.43	2.4582	17 9 14.8	5.482
13	7 21 44.76	2.4528	17 3 42.8	5.585
14	7 24 11.77	2.4474	16 58 4.6	5.688
15	7 26 38.45	2.4419	16 52 20.2	5.790
16	7 29 4.80	2.4364	16 46 29.8	5.890
17	7 31 30.82	2.4308	16 40 33.4	5.989
18	7 33 56.50	2.4252	16 34 31.1	6.087
19	7 36 21.84	2.4196	16 28 23.0	6.183
20	7 38 46.85	2.4140	16 22 9.1	6.279
21	7 41 11.52	2.4083	16 15 49.5	6.373
22	7 43 35.85	2.4026	16 9 24.3	6.466
23	7 45 59.83	2.3969	N.16 2 53.6	6.557

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 48 23.47	2.3911	N.15 56 17.4	6.648
1	7 50 46.76	2.3853	15 49 35.8	6.737
2	7 53 9.71	2.3796	15 42 48.9	6.825
3	7 55 32.31	2.3737	15 35 56.8	6.911
4	7 57 54.55	2.3678	15 28 59.6	6.997
5	8 0 16.45	2.3621	15 21 57.2	7.082
6	8 2 38.00	2.3563	15 14 49.8	7.164
7	8 4 59.20	2.3504	15 7 37.5	7.246
8	8 7 20.05	2.3445	15 0 20.3	7.326
9	8 9 40.54	2.3386	14 52 58.4	7.404
10	8 12 0.68	2.3327	14 45 31.8	7.482
11	8 14 20.47	2.3269	14 38 0.5	7.560
12	8 16 39.91	2.3211	14 30 24.6	7.635
13	8 18 59.00	2.3152	14 22 44.3	7.708
14	8 21 17.74	2.3093	14 14 59.6	7.781
15	8 23 36.12	2.3034	14 7 10.5	7.853
16	8 25 54.15	2.2976	13 59 17.2	7.923
17	8 28 11.84	2.2919	13 51 19.7	7.993
18	8 30 29.18	2.2861	13 43 18.0	8.062
19	8 32 46.17	2.2802	13 35 12.3	8.128
20	8 35 2.81	2.2745	13 27 2.7	8.193
21	8 37 19.11	2.2687	13 18 49.2	8.257
22	8 39 35.06	2.2629	13 10 31.9	8.320
23	8 41 50.66	2.2572	13 2 10.8	8.382
24	8 44 5.92	2.2515	N.12 53 46.1	8.442

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 17.					**WEDNESDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 44 5.92	2.2515	N. 12 53 46.1	8.442	0	10 26 13.58	2.0207	N. 5 19 46.4	10.088
1	8 46 20.84	2.2458	12 45 17.8	8.502	1	10 28 14.71	2.0171	5 9 40.8	10.099
2	8 48 35.42	2.2401	12 36 45.9	8.560	2	10 30 15.63	2.0136	4 59 34.5	10.111
3	8 50 49.65	2.2344	12 28 10.6	8.617	3	10 32 16.34	2.0101	4 49 27.5	10.121
4	8 53 3.55	2.2288	12 19 31.9	8.672	4	10 34 16.84	2.0066	4 39 20.0	10.130
5	8 55 17.11	2.2232	12 10 49.9	8.727	5	10 36 17.13	2.0032	4 29 11.9	10.139
6	8 57 30.34	2.2177	12 2 4.6	8.781	6	10 38 17.22	1.9998	4 19 3.3	10.147
7	8 59 43.24	2.2122	11 53 16.2	8.833	7	10 40 17.11	1.9966	4 8 54.3	10.153
8	9 1 55.80	2.2066	11 44 24.7	8.884	8	10 42 16.81	1.9934	3 58 44.9	10.159
9	9 4 8.03	2.2011	11 35 30.1	8.935	9	10 44 16.32	1.9902	3 48 35.2	10.164
10	9 6 19.93	2.1957	11 26 32.5	8.984	10	10 46 15.64	1.9871	3 38 25.2	10.169
11	9 8 31.51	2.1903	11 17 32.0	9.032	11	10 48 14.77	1.9840	3 28 14.9	10.173
12	9 10 42.77	2.1849	11 8 28.7	9.078	12	10 50 13.72	1.9810	3 18 4.4	10.177
13	9 12 53.70	2.1796	10 59 22.7	9.123	13	10 52 12.49	1.9781	3 7 53.7	10.179
14	9 15 4.32	2.1743	10 50 13.9	9.168	14	10 54 11.09	1.9752	2 57 42.9	10.181
15	9 17 14.62	2.1690	10 41 2.5	9.212	15	10 56 9.52	1.9724	2 47 32.0	10.182
16	9 19 24.60	2.1638	10 31 48.5	9.254	16	10 58 7.78	1.9697	2 37 21.0	10.182
17	9 21 34.27	2.1586	10 22 32.0	9.295	17	11 0 5.88	1.9669	2 27 10.1	10.182
18	9 23 43.63	2.1534	10 13 13.1	9.335	18	11 2 3.81	1.9642	2 16 59.2	10.181
19	9 25 52.68	2.1483	10 3 51.8	9.374	19	11 4 1.59	1.9616	2 6 48.4	10.179
20	9 28 1.43	2.1432	9 54 28.2	9.412	20	11 5 59.21	1.9591	1 56 37.7	10.177
21	9 30 9.87	2.1382	9 45 2.3	9.450	21	11 7 56.68	1.9567	1 46 27.1	10.175
22	9 32 18.01	2.1332	9 35 34.2	9.486	22	11 9 54.01	1.9542	1 36 16.7	10.171
23	9 34 25.85	2.1282	N. 9 26 4.0	9.521	23	11 11 51.19	1.9518	N. 1 26 6.6	10.167
	TUESDAY 18.					**THURSDAY 20.**			
0	9 36 33.40	2.1233	N. 9 16 31.7	9.555	0	11 13 48.23	1.9495	N. 1 15 56.7	10.162
1	9 38 40.65	2.1184	9 6 57.4	9.587	1	11 15 45.13	1.9473	1 5 47.2	10.156
2	9 40 47.61	2.1137	8 57 21.2	9.619	2	11 17 41.90	1.9451	0 55 38.0	10.150
3	9 42 54.29	2.1090	8 47 43.1	9.651	3	11 19 38.54	1.9429	0 45 29.2	10.143
4	9 45 0.69	2.1043	8 38 3.1	9.681	4	11 21 35.05	1.9408	0 35 20.8	10.136
5	9 47 6.81	2.0997	8 28 21.4	9.709	5	11 23 31.44	1.9388	0 25 12.9	10.128
6	9 49 12.65	2.0950	8 18 38.0	9.737	6	11 25 27.71	1.9368	0 15 5.4	10.120
7	9 51 18.21	2.0904	8 8 52.9	9.765	7	11 27 23.86	1.9349	N. 0 4 58.5	10.110
8	9 53 23.50	2.0859	7 59 6.2	9.791	8	11 29 19.90	1.9331	S. 0 5 7.8	10.101
9	9 55 28.52	2.0814	7 49 18.0	9.816	9	11 31 15.83	1.9313	0 15 13.6	10.091
10	9 57 33.27	2.0770	7 39 28.3	9.840	10	11 33 11.65	1.9295	0 25 18.7	10.079
11	9 59 37.76	2.0727	7 29 37.2	9.863	11	11 35 7.37	1.9277	0 35 23.1	10.067
12	10 1 41.99	2.0683	7 19 44.7	9.886	12	11 37 2.98	1.9261	0 45 26.8	10.055
13	10 3 45.96	2.0641	7 9 50.9	9.907	13	11 38 58.50	1.9246	0 55 29.7	10.043
14	10 5 49.68	2.0599	6 59 55.8	9.928	14	11 40 53.93	1.9230	1 5 31.9	10.030
15	10 7 53.15	2.0557	6 49 59.5	9.948	15	11 42 49.26	1.9215	1 15 33.3	10.016
16	10 9 56.37	2.0516	6 40 2.0	9.967	16	11 44 44.51	1.9201	1 25 33.8	10.001
17	10 11 59.34	2.0475	6 30 3.4	9.986	17	11 46 39.68	1.9188	1 35 33.4	9.986
18	10 14 2.07	2.0435	6 20 3.7	10.003	18	11 48 34.77	1.9175	1 45 32.1	9.970
19	10 16 4.56	2.0396	6 10 3.0	10.019	19	11 50 29.78	1.9163	1 55 29.8	9.954
20	10 18 6.82	2.0357	6 0 1.4	10.034	20	11 52 24.72	1.9151	2 5 26.6	9.938
21	10 20 8.85	2.0319	5 49 58.9	10.049	21	11 54 19.59	1.9139	2 15 22.4	9.922
22	10 22 10.65	2.0282	5 39 55.5	10.063	22	11 56 14.39	1.9128	2 25 17.2	9.903
23	10 24 12.23	2.0244	5 29 51.3	10.076	23	11 58 9.13	1.9118	2 35 10.8	9.884
24	10 26 13.58	2.0207	N. 5 19 46.4	10.088	24	12 0 3.80	1.9108	S. 2 45 3.3	9.865

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 0 3.80	1.9108	S. 2 45 3.3	9.865
1	12 1 58.42	1.9099	2 54 54.6	9.846
2	12 3 52.99	1.9090	3 4 44.8	9.827
3	12 5 47.50	1.9081	3 14 33.8	9.806
4	12 7 41.96	1.9073	3 24 21.5	9.785
5	12 9 36.38	1.9066	3 34 8.0	9.764
6	12 11 30.76	1.9060	3 43 53.2	9.742
7	12 13 25.10	1.9054	3 53 37.0	9.719
8	12 15 19.41	1.9048	4 3 19.5	9.696
9	12 17 13.68	1.9042	4 13 0.6	9.672
10	12 19 7.92	1.9038	4 22 40.2	9.648
11	12 21 2.14	1.9034	4 32 18.4	9.624
12	12 22 56.33	1.9030	4 41 55.1	9.599
13	12 24 50.50	1.9027	4 51 30.3	9.573
14	12 26 44.66	1.9025	5 1 3.9	9.547
15	12 28 38.80	1.9023	5 10 35.9	9.520
16	12 30 32.93	1.9022	5 20 6.3	9.493
17	12 32 27.06	1.9021	5 29 35.1	9.466
18	12 34 21.18	1.9020	5 39 2.2	9.437
19	12 36 15.30	1.9020	5 48 27.6	9.408
20	12 38 9.42	1.9020	5 57 51.2	9.379
21	12 40 3.54	1.9021	6 7 13.1	9.350
22	12 41 57.67	1.9022	6 16 33.2	9.319
23	12 43 51.80	1.9023	S. 6 25 51.4	9.288

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 45 45.95	1.9026	S. 6 35 7.8	9.257
1	12 47 40.12	1.9029	6 44 22.3	9.226
2	12 49 34.30	1.9032	6 53 34.9	9.194
3	12 51 28.50	1.9036	7 2 45.6	9.162
4	12 53 22.73	1.9040	7 11 54.3	9.128
5	12 55 16.98	1.9044	7 21 1.0	9.094
6	12 57 11.26	1.9049	7 30 5.6	9.060
7	12 59 5.57	1.9055	7 39 8.2	9.026
8	13 0 59.92	1.9062	7 48 8.7	8.991
9	13 2 54.31	1.9068	7 57 7.1	8.955
10	13 4 48.74	1.9075	8 6 3.3	8.918
11	13 6 43.21	1.9082	8 14 57.3	8.882
12	13 8 37.72	1.9089	8 23 49.1	8.845
13	13 10 32.28	1.9097	8 32 38.7	8.807
14	13 12 26.89	1.9106	8 41 26.0	8.769
15	13 14 21.55	1.9115	8 50 11.0	8.731
16	13 16 16.27	1.9125	8 58 53.7	8.692
17	13 18 11.05	1.9134	9 7 34.0	8.652
18	13 20 5.88	1.9144	9 16 11.9	8.612
19	13 22 0.78	1.9155	9 24 47.4	8.571
20	13 23 55.74	1.9166	9 33 20.4	8.530
21	13 25 50.77	1.9177	9 41 51.0	8.489
22	13 27 45.87	1.9189	9 50 19.1	8.447
23	13 29 41.04	1.9202	9 58 44.6	8.404
24	13 31 36.29	1.9215	S. 10 7 7.6	8.361

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 31 36.29	1.9215	S. 10 7 7.6	8.361
1	13 33 31.62	1.9227	10 15 28.0	8.317
2	13 35 27.02	1.9240	10 23 45.7	8.273
3	13 37 22.50	1.9253	10 32 0.8	8.229
4	13 39 18.06	1.9267	10 40 13.2	8.183
5	13 41 13.71	1.9282	10 48 22.8	8.137
6	13 43 9.45	1.9297	10 56 29.7	8.092
7	13 45 5.28	1.9312	11 4 33.9	8.046
8	13 47 1.20	1.9327	11 12 35.2	7.999
9	13 48 57.21	1.9343	11 20 33.7	7.951
10	13 50 53.32	1.9360	11 28 29.3	7.902
11	13 52 49.53	1.9377	11 36 22.0	7.854
12	13 54 45.84	1.9393	11 44 11.8	7.805
13	13 56 42.25	1.9410	11 51 58.6	7.755
14	13 58 38.76	1.9428	11 59 42.4	7.705
15	14 0 35.38	1.9446	12 7 23.2	7.654
16	14 2 32.11	1.9464	12 15 0.9	7.603
17	14 4 28.95	1.9482	12 22 35.6	7.552
18	14 6 25.89	1.9500	12 30 7.2	7.500
19	14 8 22.95	1.9519	12 37 35.6	7.448
20	14 10 20.12	1.9538	12 45 0.9	7.395
21	14 12 17.41	1.9558	12 52 23.0	7.341
22	14 14 14.82	1.9577	12 59 41.8	7.286
23	14 16 12.34	1.9597	S. 13 6 57.3	7.231

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 18 9.98	1.9617	S. 13 14 9.5	7.176
1	14 20 7.74	1.9638	13 21 18.4	7.120
2	14 22 5.63	1.9659	13 28 23.9	7.064
3	14 24 3.65	1.9681	13 35 26.1	7.007
4	14 26 1.80	1.9702	13 42 24.8	6.950
5	14 28 0.07	1.9723	13 49 20.1	6.892
6	14 29 58.47	1.9744	13 56 11.9	6.834
7	14 31 57.00	1.9766	14 3 0.2	6.775
8	14 33 55.66	1.9788	14 9 44.9	6.715
9	14 35 54.46	1.9811	14 16 26.0	6.655
10	14 37 53.39	1.9833	14 23 3.5	6.595
11	14 39 52.45	1.9855	14 29 37.4	6.535
12	14 41 51.65	1.9878	14 36 7.7	6.473
13	14 43 50.99	1.9901	14 42 34.2	6.411
14	14 45 50.47	1.9924	14 48 57.0	6.349
15	14 47 50.08	1.9948	14 55 16.1	6.286
16	14 49 49.84	1.9972	15 1 31.4	6.222
17	14 51 49.74	1.9995	15 7 42.8	6.158
18	14 53 49.78	2.0019	15 13 50.4	6.094
19	14 55 49.97	2.0043	15 19 54.1	6.029
20	14 57 50.30	2.0067	15 25 53.9	5.963
21	14 59 50.77	2.0091	15 31 49.7	5.897
22	15 1 51.39	2.0116	15 37 41.5	5.830
23	15 3 52.16	2.0140	15 43 29.3	5.763
24	15 5 53.07	2.0164	S. 15 49 13.1	5.696

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 25.					THURSDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 5 53.07	2.0164	S. 15 49 13.1	5.696	0	16 45 29.70	2.1305	S. 18 55 18.2	1.882
1	15 7 54.13	2.0189	15 54 52.8	5.628	1	16 47 37.59	2.1325	18 57 8.5	1.792
2	15 9 55.34	2.0214	16 0 28.4	5.559	2	16 49 45.60	2.1344	18 58 53.3	1.702
3	15 11 56.70	2.0239	16 5 59.9	5.490	3	16 51 53.72	2.1363	19 0 32.7	1.612
4	15 13 58.21	2.0263	16 11 27.2	5.420	4	16 54 1.96	2.1382	19 2 6.7	1.521
5	15 15 59.86	2.0287	16 16 50.3	5.350	5	16 56 10.31	2.1401	19 3 35.2	1.429
6	15 18 1.66	2.0312	16 22 9.2	5.279	6	16 58 18.77	2.1419	19 4 58.2	1.338
7	15 20 3.61	2.0337	16 27 23.8	5.208	7	17 0 27.34	2.1438	19 6 15.8	1.246
8	15 22 5.71	2.0362	16 32 34.1	5.136	8	17 2 36.02	2.1456	19 7 27.8	1.154
9	15 24 7.96	2.0387	16 37 40.1	5.063	9	17 4 44.81	2.1473	19 8 34.3	1.062
10	15 26 10.36	2.0412	16 42 41.7	4.991	10	17 6 53.70	2.1491	19 9 35.3	0.970
11	15 28 12.91	2.0438	16 47 39.0	4.918	11	17 9 2.70	2.1508	19 10 30.7	0.877
12	15 30 15.62	2.0464	16 52 31.9	4.844	12	17 11 11.80	2.1525	19 11 20.5	0.783
13	15 32 18.48	2.0489	16 57 20.3	4.769	13	17 13 21.00	2.1541	19 12 4.7	0.690
14	15 34 21.48	2.0513	17 2 4.2	4.695	14	17 15 30.29	2.1557	19 12 43.3	0.597
15	15 36 24.63	2.0538	17 6 43.7	4.620	15	17 17 39.68	2.1572	19 13 16.3	0.503
16	15 38 27.93	2.0563	17 11 18.6	4.544	16	17 19 49.16	2.1587	19 13 43.7	0.409
17	15 40 31.38	2.0588	17 15 49.0	4.468	17	17 21 58.73	2.1603	19 14 5.4	0.314
18	15 42 34.98	2.0612	17 20 14.8	4.392	18	17 24 8.40	2.1618	19 14 21.4	0.219
19	15 44 38.73	2.0637	17 24 36.0	4.314	19	17 26 18.15	2.1632	19 14 31.7	0.125
20	15 46 42.63	2.0662	17 28 52.5	4.236	20	17 28 27.98	2.1645	19 14 36.4	− 0.031
21	15 48 46.68	2.0687	17 33 4.3	4.157	21	17 30 37.89	2.1659	19 14 35.4	+ 0.064
22	15 50 50.88	2.0712	17 37 11.4	4.079	22	17 32 47.89	2.1672	19 14 28.7	0.159
23	15 52 55.23	2.0737	S. 17 41 13.8	4.001	23	17 34 57.96	2.1685	S. 19 14 16.3	0.256
	WEDNESDAY 26.					FRIDAY 28.			
0	15 54 59.72	2.0761	S. 17 45 11.5	3.922	0	17 37 8.11	2.1697	S. 19 13 58.1	0.351
1	15 57 4.36	2.0786	17 49 4.4	3.842	1	17 39 18.33	2.1709	19 13 34.2	0.447
2	15 59 9.16	2.0810	17 52 52.5	3.761	2	17 41 28.62	2.1721	19 13 4.5	0.542
3	16 1 14.08	2.0834	17 56 35.7	3.679	3	17 43 38.98	2.1733	19 12 29.1	0.638
4	16 3 19.16	2.0858	18 0 14.0	3.598	4	17 45 49.41	2.1744	19 11 47.9	0.734
5	16 5 24.38	2.0882	18 3 47.4	3.516	5	17 47 59.91	2.1755	19 11 1.0	0.830
6	16 7 29.74	2.0906	18 7 15.9	3.433	6	17 50 10.47	2.1765	19 10 8.3	0.927
7	16 9 35.25	2.0930	18 10 39.4	3.351	7	17 52 21.09	2.1774	19 9 9.8	1.023
8	16 11 40.90	2.0953	18 13 58.0	3.268	8	17 54 31.76	2.1783	19 8 5.5	1.119
9	16 13 46.69	2.0977	18 17 11.6	3.185	9	17 56 42.49	2.1792	19 6 55.5	1.215
10	16 15 52.62	2.1000	18 20 20.2	3.101	10	17 58 53.27	2.1801	19 5 39.7	1.312
11	16 17 58.69	2.1022	18 23 23.7	3.016	11	18 1 4.10	2.1810	19 4 18.1	1.409
12	16 20 4.89	2.1045	18 26 22.1	2.931	12	18 3 14.99	2.1818	19 2 50.6	1.506
13	16 22 11.23	2.1068	18 29 15.4	2.846	13	18 5 25.92	2.1825	19 1 17.3	1.602
14	16 24 17.71	2.1091	18 32 3.6	2.760	14	18 7 36.89	2.1832	18 59 38.3	1.698
15	16 26 24.33	2.1114	18 34 46.6	2.674	15	18 9 47.90	2.1838	18 57 53.5	1.795
16	16 28 31.08	2.1136	18 37 24.5	2.588	16	18 11 58.95	2.1845	18 56 2.9	1.892
17	16 30 37.96	2.1157	18 39 57.2	2.501	17	18 14 10.04	2.1852	18 54 6.5	1.989
18	16 32 44.97	2.1179	18 42 24.6	2.413	18	18 16 21.17	2.1858	18 52 4.2	2.086
19	16 34 52.11	2.1201	18 44 46.8	2.326	19	18 18 32.33	2.1863	18 49 56.1	2.182
20	16 36 59.38	2.1222	18 47 3.7	2.237	20	18 20 43.52	2.1867	18 47 42.3	2.278
21	16 39 6.77	2.1242	18 49 15.3	2.149	21	18 22 54.73	2.1871	18 45 22.7	2.375
22	16 41 14.29	2.1263	18 51 21.6	2.061	22	18 25 5.97	2.1875	18 42 57.3	2.471
23	16 43 21.93	2.1284	18 53 22.6	1.972	23	18 27 17.23	2.1878	18 40 26.1	2.567
24	16 45 29.70	2.1305	S. 18 55 18.2	1.882	24	18 29 28.51	2.1882	S. 18 37 49.2	2.663

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 29 28.51	2.1882	S. 18 37 49.2	2.663
1	18 31 39.81	2.1885	18 35 6.5	2.760
2	18 33 51.13	2.1887	18 32 16.0	2.856
3	18 36 2.46	2.1890	18 29 23.7	2.952
4	18 38 13.81	2.1892	18 26 23.7	3.047
5	18 40 25.17	2.1893	18 23 18.0	3.143
6	18 42 36.53	2.1894	18 20 6.5	3.239
7	18 44 47.90	2.1895	18 16 49.3	3.334
8	18 46 59.27	2.1895	18 13 26.4	3.429
9	18 49 10.64	2.1895	18 9 57.8	3.524
10	18 51 22.01	2.1895	18 6 23.5	3.619
11	18 53 33.38	2.1895	18 2 43.5	3.714
12	18 55 44.75	2.1894	17 58 57.8	3.808
13	18 57 56.11	2.1892	17 55 6.5	3.902
14	19 0 7.46	2.1891	17 51 9.6	3.996
15	19 2 18.80	2.1889	17 47 7.0	4.090
16	19 4 30.13	2.1887	17 42 58.8	4.183
17	19 6 41.44	2.1884	17 38 45.0	4.276
18	19 8 52.73	2.1881	17 34 25.7	4.368
19	19 11 4.01	2.1878	17 30 0.8	4.461
20	19 13 15.27	2.1874	17 25 30.4	4.553
21	19 15 26.50	2.1870	17 20 54.4	4.646
22	19 17 37.71	2.1867	17 16 12.9	4.737
23	19 19 48.90	2.1863	S. 17 11 26.0	4.827

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 22 0.06	2.1858	S. 17 6 33.6	4.918
1	19 24 11.19	2.1853	17 1 35.8	5.009
2	19 26 22.29	2.1848	16 56 32.5	5.100
3	19 28 33.36	2.1843	16 51 23.8	5.190
4	19 30 44.40	2.1837	16 46 9.7	5.279
5	19 32 55.40	2.1831	16 40 50.3	5.368
6	19 35 6.37	2.1825	16 35 25.6	5.457
7	19 37 17.30	2.1818	16 29 55.5	5.546
8	19 39 28.19	2.1812	16 24 20.1	5.633
9	19 41 39.04	2.1805	16 18 39.5	5.720
10	19 43 49.85	2.1797	16 12 53.7	5.807
11	19 46 0.61	2.1790	16 7 2.7	5.893
12	19 48 11.33	2.1783	16 1 6.5	5.979
13	19 50 22.01	2.1776	15 55 5.2	6.065
14	19 52 32.64	2.1767	15 48 58.7	6.151
15	19 54 43.22	2.1759	15 42 47.1	6.235
16	19 56 53.75	2.1752	15 36 30.5	6.319
17	19 59 4.24	2.1744	15 30 8.8	6.403
18	20 1 14.68	2.1736	15 23 42.1	6.487
19	20 3 25.07	2.1727	15 17 10.4	6.569
20	20 5 35.41	2.1718	15 10 33.8	6.651
21	20 7 45.69	2.1709	15 3 52.3	6.732
22	20 9 55.92	2.1701	14 57 5.9	6.814
23	20 12 6.10	2.1692	14 50 14.6	6.895
24	20 14 16.23	2.1683	S. 14 43 18.5	6.975

MONDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 14 16.23	2.1683	S. 14 43 18.5	6.975
1	20 16 26.30	2.1674	14 36 17.6	7.054
2	20 18 36.32	2.1665	14 29 12.0	7.133
3	20 20 46.28	2.1656	14 22 1.7	7.211
4	20 22 56.19	2.1647	14 14 46.7	7.288
5	20 25 6.04	2.1637	14 7 27.1	7.366
6	20 27 15.83	2.1627	14 0 2.8	7.443
7	20 29 25.57	2.1618	13 52 33.9	7.519
8	20 31 35.25	2.1608	13 45 0.5	7.594
9	20 33 44.87	2.1599	13 37 22.6	7.668
10	20 35 54.44	2.1590	13 29 40.3	7.742
11	20 38 3.95	2.1580	13 21 53.6	7.815
12	20 40 13.40	2.1571	13 14 2.5	7.888
13	20 42 22.80	2.1562	13 6 7.0	7.961
14	20 44 32.14	2.1552	12 58 7.2	8.032
15	20 46 41.42	2.1542	12 50 3.1	8.103
16	20 48 50.65	2.1533	12 41 54.8	8.173
17	20 50 59.82	2.1524	12 33 42.3	8.243
18	20 53 8.94	2.1515	12 25 25.7	8.312
19	20 55 18.00	2.1506	12 17 4.9	8.380
20	20 57 27.01	2.1497	12 8 40.1	8.448
21	20 59 35.96	2.1487	12 0 11.2	8.515
22	21 1 44.86	2.1478	11 51 38.3	8.581
23	21 3 53.70	2.1469	S. 11 43 1.5	8.646

TUESDAY, JANUARY 1, 1884.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 6 2.49	2.1461	S. 11 34 20.8	8.711

PHASES OF THE MOON.

	d	h	m
☽ First Quarter . . .	6	23	45.9
○ Full Moon	13	15	28.3
☾ Last Quarter. . . .	20	20	8.4
● New Moon	29	0	59.7

	d	h
☾ Perigee.	12	3.5
☾ Apogee.	24	3.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	19° 28′ 21″	3351	20° 51′ 33″	3339	22° 14′ 59″	3328	23° 38′ 38″	3317
	Fomalhaut	E.	67 49 32	3463	66 28 27	3470	65 7 29	3477	63 46 39	3486
	α Pegasi	E.	82 47 53	3102	81 19 46	3097	79 51 33	3092	78 23 14	3087
2	Sun	W.	30 40 4	3264	32 4 57	3254	33 30 2	3245	34 55 18	3236
	Fomalhaut	E.	57 5 20	3549	55 45 50	3567	54 26 40	3586	53 7 51	3610
	α Pegasi	E.	71 0 17	3067	69 31 27	3064	68 2 33	3060	66 33 35	3058
3	Sun	W.	42 4 29	3187	43 30 54	3177	44 57 31	3167	46 24 20	3156
	Fomalhaut	E.	46 41 0	3772	45 25 29	3818	44 10 45	3868	42 56 53	3926
	α Pegasi	E.	59 8 3	3049	57 38 51	3050	56 9 40	3051	54 40 30	3051
4	Sun	W.	53 41 36	3103	55 9 42	3091	56 38 2	3080	58 6 36	3069
	α Pegasi	E.	47 15 28	3075	45 46 48	3084	44 18 19	3096	42 50 4	3109
	α Arietis	E.	89 35 10	2804	88 0 48	2795	86 26 13	2785	84 51 25	2775
5	Sun	W.	65 33 2	3009	67 3 4	2996	68 33 22	2983	70 3 56	2970
	α Arietis	E.	76 54 5	2723	75 17 56	2713	73 41 34	2703	72 4 58	2692
	Saturn	E.	107 43 23	2621	106 4 57	2610	104 26 16	2599	102 47 19	2587
6	Sun	W.	77 40 54	2902	79 13 10	2889	80 45 43	2876	82 18 33	2862
	α Aquilæ	W.	38 51 15	3710	40 7 51	3619	41 26 5	3536	42 45 49	3460
	α Arietis	E.	63 58 27	2641	62 20 27	2631	60 42 14	2621	59 3 48	2611
	Saturn	E.	94 28 27	2525	92 47 49	2513	91 6 54	2499	89 25 40	2487
	Aldebaran	E.	96 50 29	2555	95 10 32	2542	93 30 17	2529	91 49 44	2515
7	Sun	W.	90 7 23	2788	91 42 6	2774	93 17 8	2759	94 52 30	2744
	α Aquilæ	W.	49 43 49	3162	51 10 43	3114	52 38 35	3070	54 7 11	3028
	α Arietis	E.	50 48 23	2567	49 8 43	2561	47 28 54	2554	45 48 56	2548
	Saturn	E.	80 54 53	2420	79 11 47	2406	77 28 21	2393	75 44 36	2379
	Aldebaran	E.	83 22 20	2448	81 39 54	2435	79 57 9	2421	78 14 4	2407
8	Sun	W.	102 54 10	2671	104 31 29	2656	106 9 8	2642	107 47 6	2627
	α Aquilæ	W.	61 43 14	2854	63 16 32	2824	64 50 29	2796	66 25 2	2769
	Fomalhaut	W.	35 29 7	4001	36 40 46	3853	37 54 54	3722	39 11 18	3604
	Saturn	E.	67 0 53	2311	65 15 9	2297	63 29 5	2283	61 42 41	2270
	Aldebaran	E.	69 33 46	2339	67 48 43	2325	66 3 20	2312	64 17 38	2298
9	Sun	W.	116 1 45	2558	117 41 37	2545	119 21 47	2533	121 2 14	2521
	α Aquilæ	W.	74 25 58	2657	76 3 36	2637	77 41 41	2618	79 20 11	2601
	Fomalhaut	W.	46 1 52	3164	47 28 44	3099	48 56 55	3038	50 26 20	2984
	α Pegasi	W.	27 23 39	3148	28 50 50	3036	30 20 18	2940	31 51 46	2857
	Saturn	E.	52 45 47	2205	50 57 27	2192	49 8 48	2180	47 19 51	2168
	Aldebaran	E.	55 24 14	2234	53 36 37	2221	51 48 41	2209	50 0 27	2196
	Pollux	E.	98 12 43	2322	96 27 15	2309	94 41 28	2296	92 55 23	2283
	Jupiter	E.	110 49 21	2233	109 1 43	2220	107 13 46	2208	105 25 30	2195
10	Fomalhaut	W.	58 8 53	2769	59 44 1	2736	61 19 53	2706	62 56 25	2677
	α Pegasi	W.	39 52 10	2569	41 31 48	2528	43 12 22	2492	44 53 47	2460
	Saturn	E.	38 10 46	2114	36 20 9	2105	34 29 17	2095	32 38 10	2086
	Aldebaran	E.	40 55 7	2145	39 5 17	2135	37 15 12	2127	35 24 54	2119
	Pollux	E.	84 0 37	2229	82 12 53	2220	80 24 56	2212	78 36 46	2204
	Jupiter	E.	96 19 39	2139	94 29 39	2128	92 39 23	2118	90 48 52	2109

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	**Sun**	W.	25° 2′ 30″	3306	26° 26′ 35″	3294	27° 50′ 53″	3284	29° 15′ 23″	3275
	Fomalhaut	E.	62 25 59	3495	61 5 29	3506	59 45 12	3518	58 25 8	3533
	α Pegasi	E.	76 54 49	3083	75 26 19	3078	73 57 43	3074	72 29 2	3071
2	**Sun**	W.	36 20 45	3225	37 46 24	3216	39 12 14	3206	40 38 16	3197
	Fomalhaut	E.	51 49 27	3635	50 31 31	3663	49 14 5	3696	47 57 13	3732
	α Pegasi	E.	65 4 34	3056	63 35 30	3053	62 6 23	3051	60 37 14	3050
3	**Sun**	W.	47 51 22	3146	49 18 36	3135	50 46 3	3124	52 13 43	3114
	Fomalhaut	E.	41 44 0	3991	40 32 12	4065	39 21 36	4147	38 12 20	4243
	α Pegasi	E.	53 11 21	3054	51 42 15	3057	50 13 13	3062	48 44 17	3068
4	**Sun**	W.	59 35 24	3057	61 4 26	3045	62 33 43	3033	64 3 15	3021
	α Pegasi	E.	41 22 5	3125	39 54 26	3144	38 27 10	3167	37 0 22	3196
	α Arietis	E.	83 16 24	2764	81 41 9	2754	80 5 41	2744	78 30 0	2734
5	**Sun**	W.	71 34 46	2957	73 5 53	2944	74 37 16	2931	76 8 56	2916
	α Arietis	E.	70 28 8	2682	68 51 4	2671	67 13 45	2661	65 36 13	2651
	Saturn	E.	101 8 6	2574	99 28 36	2563	97 48 50	2551	96 8 47	2538
6	**Sun**	W.	83 51 41	2847	85 25 8	2832	86 58 54	2818	88 32 59	2803
	α Aquilæ	W.	44 6 58	3391	45 29 25	3326	46 53 6	3268	48 17 55	3213
	α Arietis	E.	57 25 8	2601	55 46 15	2593	54 7 10	2583	52 27 52	2575
	Saturn	E.	87 44 8	2473	86 2 17	2460	84 20 8	2447	82 37 40	2433
	Aldebaran	E.	90 8 52	2502	88 27 42	2489	86 46 14	2476	85 4 27	2462
7	**Sun**	W.	96 28 11	2730	98 4 11	2715	99 40 31	2700	101 17 11	2686
	α Aquilæ	W.	55 36 59	2989	57 7 26	2952	58 38 39	2917	60 10 36	2885
	α Arietis	E.	44 8 50	2543	42 28 37	2540	40 48 20	2539	39 8 1	2539
	Saturn	E.	74 0 31	2365	72 16 6	2352	70 31 22	2337	68 46 17	2324
	Aldebaran	E.	76 30 40	2393	74 46 56	2380	73 2 52	2366	71 18 29	2353
8	**Sun**	W.	109 25 24	2613	111 4 1	2599	112 42 57	2585	114 22 12	2572
	α Aquilæ	W.	68 0 10	2744	69 35 51	2720	71 12 4	2698	72 48 47	2677
	Fomalhaut	W.	40 29 48	3497	41 50 15	3401	43 12 30	3314	44 36 25	3236
	Saturn	E.	59 55 57	2257	58 8 54	2243	56 21 31	2231	54 33 49	2217
	Aldebaran	E.	62 31 36	2285	60 45 14	2272	58 58 33	2259	57 11 33	2246
9	**Sun**	W.	122 42 58	2509	124 23 59	2497	126 5 17	2486	127 46 50	2475
	α Aquilæ	W.	80 59 4	2586	82 38 18	2572	84 17 52	2558	85 57 45	2545
	Fomalhaut	W.	51 56 53	2934	53 28 29	2887	55 1 4	2845	56 34 33	2806
	α Pegasi	W.	33 25 0	2784	34 59 49	2719	36 36 3	2663	38 13 33	2613
	Saturn	E.	45 30 36	2157	43 41 4	2145	41 51 14	2135	40 1 8	2124
	Aldebaran	E.	48 11 56	2186	46 23 8	2175	44 34 3	2165	42 44 43	2155
	Pollux	E.	91 8 59	2272	89 22 18	2260	87 35 20	2249	85 48 6	2239
	Jupiter	E.	103 36 55	2183	101 48 2	2171	99 58 51	2160	98 9 23	2149
10	**Fomalhaut**	W.	64 33 35	2652	66 11 20	2628	67 49 37	2606	69 28 24	2587
	α Pegasi	W.	46 35 57	2430	48 18 49	2403	50 2 19	2380	51 46 23	2357
	Saturn	E.	30 46 49	2077	28 55 15	2070	27 3 30	2064	25 11 35	2057
	Aldebaran	E.	33 34 24	2112	31 43 43	2105	29 52 52	2100	28 1 52	2094
	Pollux	E.	76 48 24	2197	74 59 52	2190	73 11 10	2185	71 22 20	2180
	Jupiter	E.	88 58 7	2101	87 7 9	2093	85 15 59	2085	83 24 37	2078

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh	P. L of Diff.	IXh.	P. L. of Diff.
11	Fomalhaut	W.	71° 7′ 37″	2569	72° 47′ 15″	2553	74° 27′ 14″	2539	76° 7′ 33″	2526
	α Pegasi	W.	53 30 59	2338	55 16 3	2320	57 1 33	2304	58 47 26	2291
	Pollux	E.	69 33 23	2176	67 44 19	2173	65 55 11	2171	64 6 0	2170
	JUPITER	E.	81 33 4	2072	79 41 22	2066	77 49 31	2061	75 57 32	2057
	MARS	E.	98 46 56	2152	96 57 16	2145	95 7 26	2139	93 17 27	2134
12	α Pegasi	W.	67 41 18	2242	69 28 43	2236	71 16 17	2232	73 3 57	2229
	Pollux	E.	55 0 13	2182	53 11 18	2188	51 22 32	2196	49 33 58	2205
	JUPITER	E.	66 36 15	2045	64 43 51	2045	62 51 27	2046	60 59 4	2048
	MARS	E.	84 5 53	2119	82 15 23	2118	80 24 51	2118	78 34 19	2119
	Regulus	E.	90 59 28	2057	89 7 22	2056	87 15 15	2056	85 23 8	2057
13	α Arietis	W.	38 24 56	2235	40 12 31	2226	42 0 19	2220	43 48 16	2216
	Pollux	E.	40 35 40	2285	38 49 19	2309	37 3 33	2337	35 18 28	2371
	JUPITER	E.	51 38 9	2067	49 46 19	2073	47 54 39	2081	46 3 11	2090
	MARS	E.	69 22 25	2135	67 32 20	2141	65 42 23	2147	63 52 36	2155
	Regulus	E.	76 3 12	2071	74 11 28	2076	72 19 52	2082	70 28 25	2089
14	α Arietis	W.	52 48 40	2222	54 36 35	2226	56 24 23	2233	58 12 1	2240
	SATURN	W.	21 46 52	2092	23 38 3	2101	25 29 0	2112	27 19 41	2122
	Aldebaran	W.	18 54 29	2143	20 44 22	2149	22 34 7	2155	24 23 42	2163
	JUPITER	E.	36 49 40	2149	34 59 56	2164	33 10 35	2182	31 21 41	2202
	MARS	E.	54 47 1	2206	52 58 42	2219	51 10 43	2233	49 23 4	2248
	Regulus	E.	61 14 7	2133	59 23 58	2144	57 34 6	2155	55 44 31	2168
15	α Arietis	W.	67 7 1	2291	68 53 14	2303	70 39 9	2317	72 24 44	2330
	SATURN	W.	36 28 39	2186	38 17 27	2200	40 5 54	2215	41 53 59	2231
	Aldebaran	W.	33 28 0	2219	35 15 59	2233	37 3 38	2247	38 50 56	2262
	MARS	E.	40 30 56	2340	38 45 55	2363	37 1 27	2387	35 17 33	2413
	Regulus	E.	46 41 37	2240	44 54 9	2257	43 7 6	2274	41 20 28	2292
	Spica	E.	100 13 38	2208	98 25 23	2223	96 37 30	2238	94 49 59	2253
16	α Arietis	W.	81 7 24	2407	82 50 48	2424	84 33 48	2441	86 16 24	2459
	SATURN	W.	50 48 33	2312	52 34 15	2329	54 19 32	2347	56 4 23	2364
	Aldebaran	W.	47 41 50	2341	49 26 49	2358	51 11 24	2375	52 55 35	2392
	Spica	E.	85 58 14	2335	84 13 6	2353	82 28 23	2371	80 44 6	2388
17	SATURN	W.	64 42 16	2455	66 24 33	2473	68 6 24	2492	69 47 49	2510
	Aldebaran	W.	61 30 8	2482	63 11 46	2501	64 52 58	2519	66 33 45	2538
	Spica	E.	72 9 4	2479	70 27 22	2497	68 46 5	2516	67 5 14	2535
	SUN	E.	135 3 54	2838	133 30 16	2857	131 57 2	2876	130 24 13	2895
18	SATURN	W.	78 8 32	2601	79 47 26	2619	81 25 55	2637	83 4 0	2654
	Aldebaran	W.	74 51 19	2629	76 29 35	2646	78 7 27	2664	79 44 55	2681
	Pollux	W.	33 40 53	2925	35 12 40	2920	36 44 34	2917	38 16 31	2916
	JUPITER	W.	20 39 58	2756	22 15 24	2752	23 50 55	2753	25 26 25	2756
	Spica	E.	58 47 22	2626	57 9 3	2644	55 31 8	2662	53 53 37	2680
	SUN	E.	122 46 13	2992	121 15 50	3010	119 45 50	3030	118 16 14	3049
19	SATURN	W.	91 8 38	2738	92 44 27	2754	94 19 55	2770	95 55 2	2785
	Aldebaran	W.	87 46 29	2766	89 21 41	2782	90 56 32	2798	92 31 3	2813
	Pollux	W.	45 55 38	2939	47 27 7	2946	48 58 27	2954	50 29 37	2962
	JUPITER	W.	33 21 54	2798	34 56 24	2809	36 30 40	2820	38 4 42	2831

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
11	Fomalhaut	W.	77° 48′ 10″	2515	79° 29′ 2″	2507	81° 10′ 6″	2499	82° 51′ 21″	2492
	α Pegasi	W.	60 33 39	2278	62 20 11	2266	64 7 0	2257	65 54 3	2249
	Pollux	E.	62 16 47	2170	60 27 34	2171	58 38 23	2173	56 49 15	2177
	Jupiter	E.	74 5 26	2053	72 13 14	2050	70 20 58	2048	68 28 38	2046
	Mars	E.	91 27 20	2130	89 37 6	2126	87 46 46	2122	85 56 21	2120
12	α Pegasi	W.	74 51 42	2226	76 39 30	2226	78 27 19	2226	80 15 8	2227
	Pollux	E.	47 45 38	2216	45 57 35	2230	44 9 52	2245	42 22 32	2264
	Jupiter	E.	59 6 44	2050	57 14 27	2052	55 22 14	2057	53 30 8	2061
	Mars	E.	76 43 49	2120	74 53 21	2123	73 2 57	2126	71 12 38	2130
	Regulus	E.	83 31 2	2058	81 38 58	2060	79 46 58	2063	77 55 2	2067
13	α Arietis	W.	45 36 19	2214	47 24 26	2214	49 12 33	2214	51 0 39	2218
	Pollux	E.	33 34 11	2408	31 50 48	2452	30 8 27	2504	28 27 19	2564
	Jupiter	E.	44 11 56	2100	42 20 56	2110	40 30 12	2122	38 39 46	2135
	Mars	E.	62 3 1	2164	60 13 39	2173	58 24 31	2183	56 35 38	2194
	Regulus	E.	68 37 9	2096	66 46 4	2104	64 55 11	2113	63 4 32	2122
14	α Arietis	W.	59 59 29	2249	61 46 44	2258	63 33 45	2268	65 20 31	2279
	Saturn	W.	29 10 6	2134	31 0 13	2147	32 50 1	2159	34 39 30	2172
	Aldebaran	W.	26 13 5	2173	28 2 13	2183	29 51 6	2194	31 39 42	2206
	Jupiter	E.	29 33 16	2223	27 45 23	2247	25 58 6	2274	24 11 29	2306
	Mars	E.	47 35 48	2264	45 48 55	2281	44 2 28	2300	42 16 28	2319
	Regulus	E.	53 55 15	2181	52 6 19	2194	50 17 43	2209	48 29 29	2224
15	α Arietis	W.	74 9 59	2345	75 54 53	2359	77 39 26	2375	79 23 36	2391
	Saturn	W.	43 41 41	2246	45 29 0	2262	47 15 55	2278	49 2 26	2295
	Aldebaran	W.	40 37 52	2276	42 24 26	2291	44 10 38	2308	45 56 26	2324
	Mars	E.	33 34 17	2441	31 51 41	2472	30 9 49	2507	28 28 45	2545
	Regulus	E.	39 34 16	2311	37 48 32	2330	36 3 16	2350	34 18 30	2373
	Spica	E.	93 2 51	2269	91 16 6	2285	89 29 44	2302	87 43 47	2318
16	α Arietis	W.	87 58 35	2477	89 40 21	2494	91 21 42	2513	93 2 37	2532
	Saturn	W.	57 48 49	2382	59 32 49	2400	61 16 24	2418	62 59 33	2436
	Aldebaran	W.	54 39 21	2410	56 22 41	2428	58 5 36	2446	59 48 5	2465
	Spica	E.	79 0 14	2406	77 16 48	2424	75 33 47	2442	73 51 12	2461
17	Saturn	W.	71 28 48	2528	73 9 22	2547	74 49 30	2565	76 29 13	2582
	Aldebaran	W.	68 14 6	2556	69 54 2	2574	71 33 32	2592	73 12 38	2610
	Spica	E.	65 24 49	2553	63 44 49	2572	62 5 15	2590	60 26 6	2608
	Sun	E.	128 51 48	2915	127 19 48	2934	125 48 12	2953	124 17 0	2973
18	Saturn	W.	84 41 41	2672	86 18 59	2689	87 55 54	2705	89 32 27	2722
	Aldebaran	W.	81 22 0	2699	82 58 41	2716	84 34 59	2733	86 10 55	2750
	Pollux	W.	39 48 29	2919	41 20 24	2922	42 52 15	2927	44 24 0	2932
	Jupiter	W.	27 1 50	2763	28 37 7	2769	30 12 15	2778	31 47 11	2788
	Spica	E.	52 16 30	2697	50 39 46	2714	49 3 25	2731	47 27 27	2748
	Sun	E.	116 47 2	3067	115 18 12	3086	113 49 45	3104	112 21 40	3121
19	Saturn	W.	97 29 49	2801	99 4 16	2815	100 38 24	2830	102 12 13	2843
	Aldebaran	W.	94 5 14	2828	95 39 5	2843	97 12 37	2858	98 45 50	2872
	Pollux	W.	52 0 37	2971	53 31 26	2961	55 2 3	2989	56 32 29	2998
	Jupiter	W.	39 38 29	2843	41 12 1	2855	42 45 18	2866	44 18 20	2877

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
19	Spica	E.	45° 51′ 51″	2765	44° 16′ 37″	2781	42° 41′ 44″	2797	41° 7′ 12″	2813
	Antares	E.	91 27 59	2801	89 53 33	2818	88 19 28	2833	86 45 43	2849
	Sun	E.	110 53 56	3139	109 26 34	3157	107 59 33	3173	106 32 52	3190
20	Pollux	W.	58 2 44	3008	59 32 47	3017	61 2 39	3026	62 32 19	3035
	Jupiter	W.	45 51 8	2889	47 23 41	2900	48 56 0	2911	50 28 5	2921
	Mars	W.	27 47 13	3083	29 15 43	3079	30 44 18	3077	32 12 56	3076
	Spica	E.	33 19 27	2885	31 46 49	2899	30 14 29	2912	28 42 26	2925
	Antares	E.	79 1 53	2922	77 30 2	2936	75 58 29	2949	74 27 12	2962
	Sun	E.	99 24 17	3268	97 59 28	3282	96 34 56	3296	95 10 40	3310
21	Pollux	W.	69 57 55	3078	71 26 31	3086	72 54 58	3093	74 23 16	3100
	Jupiter	W.	58 5 18	2969	59 36 9	2978	61 6 49	2986	62 37 19	2994
	Mars	W.	39 35 58	3085	41 4 26	3088	42 32 50	3091	44 1 10	3095
	Regulus	W.	33 0 49	3029	34 30 26	3034	35 59 56	3040	37 29 19	3045
	Antares	E.	66 54 45	3022	65 24 59	3032	63 55 26	3043	62 26 6	3053
	Sun	E.	88 13 5	3371	86 50 15	3381	85 27 37	3392	84 5 11	3401
22	Pollux	W.	81 42 39	3133	83 10 9	3138	84 37 33	3143	86 4 51	3147
	Jupiter	W.	70 7 32	3027	71 37 11	3032	73 6 44	3037	74 36 11	3042
	Mars	W.	51 21 47	2111	52 49 43	3114	54 17 36	3117	55 45 25	3119
	Regulus	W.	44 54 34	3071	46 23 19	3076	47 51 58	3080	49 20 32	3083
	Antares	E.	55 2 26	3098	53 34 14	3106	52 6 12	3114	50 38 20	3123
	Sun	E.	77 15 31	3442	75 54 2	3448	74 32 40	3454	73 11 25	3460
23	Jupiter	W.	82 2 11	3058	83 31 12	3060	85 0 11	3061	86 29 8	3062
	Mars	W.	63 3 59	3125	64 31 38	3126	65 59 16	3126	67 26 54	3125
	Regulus	W.	56 42 26	3096	58 10 41	3097	59 38 54	3099	61 7 5	3100
	Antares	E.	43 21 17	3159	41 54 19	3166	40 27 29	3173	39 0 48	3181
	Sun	E.	66 26 36	3482	65 5 52	3484	63 45 10	3487	62 24 31	3488
24	Jupiter	W.	93 53 42	3062	95 22 38	3061	96 51 35	3060	98 20 34	3057
	Mars	W.	74 45 18	3119	76 13 4	3117	77 40 53	3114	79 8 45	3111
	Regulus	W.	68 27 57	3097	69 56 10	3096	71 24 25	3094	72 52 42	3092
	Antares	E.	31 49 51	3228	30 24 15	3241	28 58 54	3254	27 33 49	3271
	Sun	E.	55 41 39	3492	54 21 6	3492	53 0 33	3491	51 39 59	3489
25	Mars	W.	86 29 6	3093	87 57 24	3088	89 25 48	3083	90 54 18	3078
	Regulus	W.	80 14 56	3076	81 43 35	3072	83 12 19	3067	84 41 9	3063
	Spica	W.	26 30 3	3064	27 58 56	3060	29 27 54	3056	30 56 58	3050
	Sun	E.	44 56 40	3479	43 35 53	3477	42 15 3	3473	40 54 9	3471
26	Regulus	W.	92 6 49	3035	93 36 18	3030	95 5 54	3023	96 35 38	3017
	Spica	W.	38 23 57	3022	39 53 42	3016	41 23 35	3009	42 53 36	3003
	Sun	E.	34 8 48	3454	32 47 33	3452	31 26 15	3448	30 4 53	3446
27	Regulus	W.	104 6 20	2982	105 36 55	2975	107 7 39	2968	108 38 32	2960
	Spica	W.	50 25 50	2967	51 56 44	2959	53 27 48	2952	54 59 1	2944
	Sun	E.	23 17 41	3446	21 56 17	3452	20 34 59	3459	19 13 49	3469
31	Sun	W.	23 27 44	3143	24 55 2	3124	26 22 42	3107	27 50 43	3091
	α Arietis	E.	92 38 25	2769	91 3 16	2761	89 27 57	2753	87 52 27	2744
	Aldebaran	E.	125 57 6	2701	124 20 28	2692	122 43 38	2684	121 6 37	2675

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
19	Spica	E.	39° 33′ 1″	2828	37° 59′ 9″	2842	36° 25′ 36″	2857	34° 52′ 22″	2872
	Antares	E.	85 12 19	2864	83 39 14	2880	82 6 29	2894	80 34 2	2908
	Sun	E.	105 6 31	3306	103 40 29	3323	102 14 47	3338	100 49 23	3353
20	Pollux	W.	64 1 48	3044	65 31 6	3053	67 0 13	3062	68 29 9	3070
	Jupiter	W.	51 59 57	2931	53 31 36	2942	55 3 2	2951	56 34 16	2961
	Mars	W.	33 41 35	3076	35 10 14	3077	36 38 52	3079	38 7 27	3082
	Spica	E.	27 10 39	2937	25 39 7	2950	24 7 51	2961	22 36 50	2973
	Antares	E.	72 56 12	2975	71 25 28	2987	69 54 59	2999	68 24 45	3010
	Sun	E.	93 46 40	3323	92 22 55	3336	90 59 25	3347	89 36 8	3359
21	Pollux	W.	75 51 25	3108	77 19 25	3114	78 47 17	3120	80 15 2	3127
	Jupiter	W.	64 7 39	3001	65 37 50	3009	67 7 52	3015	68 37 46	3022
	Mars	W.	45 29 26	3098	46 57 38	3102	48 25 45	3105	49 53 48	3109
	Regulus	W.	38 58 36	3051	40 27 45	3056	41 56 48	3062	43 25 44	3067
	Antares	E.	60 56 59	3063	59 28 4	3072	57 59 20	3082	56 30 48	3090
	Sun	E.	82 42 55	3410	81 20 50	3419	79 58 55	3427	78 37 9	3434
22	Pollux	W.	87 32 4	3151	88 59 12	3155	90 26 15	3159	91 53 13	3162
	Jupiter	W.	76 5 32	3046	77 34 48	3050	79 3 59	3052	80 33 7	3056
	Mars	W.	57 13 12	3121	58 40 56	3123	60 8 38	3124	61 36 19	3124
	Regulus	W.	50 49 2	3087	52 17 28	3090	53 45 50	3092	55 14 9	3094
	Antares	E.	49 10 38	3130	47 43 5	3137	46 15 40	3144	44 48 24	3152
	Sun	E.	71 50 16	3465	70 29 13	3471	69 8 16	3475	67 47 24	3479
23	Jupiter	W.	87 58 4	3063	89 26 59	3064	90 55 53	3064	92 24 47	3063
	Mars	W.	68 54 33	3125	70 22 12	3124	71 49 52	3123	73 17 34	3121
	Regulus	W.	62 35 15	3100	64 3 25	3100	65 31 35	3099	66 59 46	3099
	Antares	E.	37 34 16	3189	36 7 54	3198	34 41 42	3207	33 15 41	3216
	Sun	E.	61 3 54	3490	59 43 19	3491	58 22 45	3492	57 2 12	3492
24	Jupiter	W.	99 49 36	3056	101 18 40	3053	102 47 47	3050	104 16 58	3047
	Mars	W.	80 36 41	3109	82 4 40	3105	83 32 44	3100	85 0 53	3097
	Regulus	W.	74 21 1	3089	75 49 24	3086	77 17 51	3083	78 46 21	3079
	Antares	E.	26 9 4	3291	24 44 42	3314	23 20 47	3343	21 57 25	3378
	Sun	E.	50 19 23	3488	48 58 46	3486	47 38 6	3484	46 17 24	3482
25	Mars	W.	92 22 54	3072	93 51 37	3068	95 20 26	3062	96 49 22	3056
	Regulus	W.	86 10 4	3058	87 39 5	3052	89 8 13	3047	90 37 27	3041
	Spica	W.	32 26 9	3045	33 55 26	3040	35 24 49	3034	36 54 19	3028
	Sun	E.	39 33 12	3467	38 12 11	3464	36 51 7	3461	35 29 59	3458
26	Regulus	W.	98 5 29	3010	99 35 29	3004	101 5 37	2997	102 35 54	2989
	Spica	W.	44 23 45	2996	45 54 3	2989	47 24 30	2982	48 55 5	2974
	Sun	E.	28 43 29	3445	27 22 3	3443	26 0 35	3443	24 39 7	3445
27	Regulus	W.	110 9 35	2953	111 40 47	2945	113 12 9	2937	114 43 41	2929
	Spica	W.	56 30 24	2936	58 1 57	2927	59 33 41	2920	61 5 35	2911
	Sun	E.	17 52 50	3484	16 32 8	3506	15 11 50	3537	13 52 7	3582
31	Sun	W.	29 19 3	3077	30 47 41	3063	32 16 36	3050	33 45 47	3038
	α Arietis	E.	86 16 46	2737	84 40 55	2729	83 4 53	2721	81 28 41	2713
	Aldebaran	E.	119 29 24	2667	117 52 0	2659	116 14 25	2650	114 36 38	2642

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 26 55.55	+ 17.705	− 24 7 5.6	+ 35.38	0 43.8
2	19 33 59.85	17.650	23 52 9.1	39.33	0 47.0
3	19 41 2.62	17.578	23 35 37.8	43.98	0 50.1
4	19 48 3.44	17.487	23 17 32.0	47.20	0 53.2
5	19 55 1.84	17.376	22 57 52.5	51.09	0 56.2
6	20 1 57.31	+ 17.242	− 22 36 40.1	+ 54.93	0 59.2
7	20 8 49.25	17 081	22 13 56.3	58.70	1 2.1
8	20 15 36.98	16.891	21 49 43.0	62.38	1 4.9
9	20 22 19.78	16.668	21 24 2.8	65.94	1 7.7
10	20 28 56.77	16.409	20 56 58.9	69.36	1 10.4
11	20 35 27.01	+ 16.103	− 20 28 35.2	+ 72.58	1 13.0
12	20 41 49.37	15.751	19 58 57.0	75.56	1 15.4
13	20 48 2.64	15.345	19 28 10.5	78.26	1 17.7
14	20 54 5.42	14.876	18 56 23.1	80.62	1 19.8
15	20 59 56.13	14.337	18 23 43.8	82.58	1 21.7
16	21 5 32.99	+ 13.720	− 17 50 23.1	+ 84.06	1 23.3
17	21 10 54.02	13.017	17 16 33.5	84.98	1 24.7
18	21 15 57.03	12.218	16 42 29.0	85.27	1 25.8
19	21 20 39.65	11.316	16 8 26.4	84.82	1 26.5
20	21 24 59.28	10.301	15 34 43.9	83.56	1 26.9
21	21 28 53.15	+ 9.168	− 15 1 42.5	+ 81.40	1 26.8
22	21 32 18.38	7.914	14 29 44.5	78.26	1 26.3
23	21 35 12.05	6 538	13 59 14.5	74.07	1 25.2
24	21 37 31.24	5.042	13 30 37.7	68.80	1 23.5
25	21 39 13.21	3.438	13 4 20.8	62.44	1 21.2
26	21 40 15.52	+ 1.740	− 12 40 49.5	+ 55.00	1 18.3
27	21 40 36.22	− 0.025	12 20 29.0	46.56	1 14.7
28	21 40 14.05	1.826	12 3 41.7	37.25	1 10.4
29	21 39 8.60	3.624	11 50 46.5	27.24	1 5.3
30	21 37 20.51	5.371	11 41 57.6	16.78	0 59.6
31	21 34 51.65	− 7.012	− 11 37 22.7	+ 6.13	0 53.2
32	21 31 45.24	− 8.492	− 11 37 2.2	− 4.38	0 46.1

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	2″.5	2″.6	2″.8	3″.0	3″.4	4″.0	4″.7
Hor. Parallax . .	6.5	6.8	7.3	8.1	9.1	10.6	12.3

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 31 45.24	− 8.492	− 11 37 2.2	− 4.38	0 46.1
2	21 28 5.76	9.757	11 40 49.1	14.43	0 38.5
3	21 23 58.97	10.760	11 48 28.7	23.70	0 30.5
4	21 19 31.59	11.466	11 59 38.5	31.92	0 22.2
5	21 14 51.10	11.852	12 13 50.5	38.85	0 13.6
6	21 10 5.26	− 11.913	− 12 30 32.3	− 44.38	0 4.9 23 56.3
7	21 5 21.75	11.661	12 49 9.5	48.47	23 47.9
8	21 0 47.79	11.194	13 9 7.3	51.11	23 39.7
9	20 56 29.78	10.340	13 29 52.3	52.43	23 31.8
10	20 52 33.08	9.355	13 50 54.4	52.56	23 24.4
11	20 49 1.94	− 8.218	− 14 11 47.2	− 51.68	23 17.4
12	20 45 59.45	6.975	14 32 8.6	49.96	23 11.0
13	20 43 27.62	5 671	14 51 40.2	47.58	23 5.0
14	20 41 27.44	4.342	15 10 8.2	44.69	22 59.6
15	20 39 59.16	3.018	15 27 22.0	41.42	22 54.7
16	20 39 2.35	− 1.723	− 15 43 13.8	− 37.86	22 50.3
17	20 38 36.10	− 0.474	15 57 37.6	34.09	22 46.4
18	20 38 39.16	+ 0.718	16 10 29.1	30.20	22 43.0
19	20 39 10.02	1.843	16 21 46.7	26.25	22 40.0
20	20 40 7.08	2.899	16 31 28.8	22.26	22 37.4
21	20 41 28.62	+ 3.884	− 16 39 34.9	− 18.24	22 35.1
22	20 43 12.96	4.799	16 46 4.4	14.23	22 33.2
23	20 45 18.43	5.646	16 50 58.0	10.25	22 31.7
24	20 47 43.45	6.428	16 54 16.4	6.29	22 30.5
25	20 50 26.49	7.148	16 56 0.1	− 2.36	22 29.5
26	20 53 26.12	+ 7.811	− 16 56 9.9	+ 1.53	22 28.8
27	20 56 41.00	8.420	16 54 46.9	5.38	22 28.3
28	21 0 9.89	8.980	16 51 52.2	9.19	22 28.1
29	21 3 51.65	9.494	16 47 26.5	12.95	22 28.0
30	21 7 45.24	9.965	16 41 31.1	16.67	22 28.1
31	21 11 49.68	+ 10.398	− 16 34 6.8	+ 20 35	22 28.4
32	21 16 4.09	+ 10.797	− 16 25 14.6	+ 23.99	22 28.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter	5″.1	5″.1	4″.8	4″.3	3″.9
Horizontal Parallax . .	13.5	13 5	12.6	11.5	10.4

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	21 3 51.65	+ 9.494	− 16 47 26.5	+ 12.95	22 28.0	1	23 51 58.63	+ 16.178	− 3 17 18.0	+112.54	23 16.5
2	21 7 45.24	9.965	16 41 31.1	16.67	22 28.1	2	23 58 28.94	16.350	2 31 45.4	115.16	23 19.1
3	21 11 49.68	10.398	16 34 6.8	20.35	22 28.4	3	0 5 3.45	16.528	1 45 10.7	117.72	23 21.8
4	21 16 4.09	10.797	16 25 14.6	23.99	22 28.9	4	0 11 42.33	16.713	0 57 35.6	120.20	23 24.6
5	21 20 27.68	11.164	16 14 55.3	27.60	22 29.5	5	0 18 25.74	16.905	− 0 9 2.1	122.58	23 27.4
6	21 24 59.72	+ 11.502	− 16 3 10.2	+ 31.17	22 30.2	6	0 25 13.83	+ 17.103	+ 0 40 27.5	+124.86	23 30.4
7	21 29 39.55	11.814	15 49 59.8	34.70	22 31.0	7	0 32 6.79	17.310	1 30 50.5	127.03	23 33.4
8	21 34 26.56	12.101	15 35 25.0	38.19	22 31.9	8	0 39 4.78	17.523	2 22 3.9	129.06	23 36.5
9	21 39 20.21	12.367	15 19 26.9	41.65	22 33.0	9	0 46 7.95	17.742	3 14 4.2	130.93	23 39.7
10	21 44 20.01	12.614	15 2 6.3	45 07	22 34 1	10	0 53 16.43	17.966	4 6 47.3	132.63	23 43.0
11	21 49 25.53	+ 12.844	− 14 43 24.0	+ 48.46	22 35.4	11	1 0 30.34	+ 18.194	+ 5 0 8.7	+134.12	23 46.4
12	21 54 36.39	13.058	14 23 20.6	51.82	22 36.7	12	1 7 49.74	18.424	5 54 3.0	135.37	23 49.9
13	21 59 52.22	13.259	14 1 57.0	55.14	22 38.1	13	1 15 14.66	18 653	6 48 24.1	136.35	23 53.5
14	22 5 12.71	13.448	13 39 13.9	58.44	22 39.5	14	1 22 45.07	18.880	7 43 5.2	137.02	23 57.2
15	22 10 37.63	13.637	13 15 12.1	61.71	22 41.1	15	1 30 20.86	19.102	8 37 58.6	137.36	
16	22 16 6.74	+ 13.797	− 12 49 52.2	+ 64.95	22 42.7	16	1 38 1.86	+ 19.314	+ 9 32 55.6	+137.31	0 0.9
17	22 21 39.83	13.959	12 23 14.9	68.15	22 44.4	17	1 45 47.78	19.511	10 27 46.3	136.85	0 4.7
18	22 27 16.69	14.114	11 55 21.0	71.33	22 46.1	18	1 53 38.24	19.690	11 22 20.7	135.94	0 8.6
19	22 32 57.24	14.264	11 26 11.2	74.48	22 47.9	19	2 1 32.74	19.845	12 16 27.5	134.54	0 12.6
20	22 38 41.35	14.410	10 55 46.1	77.61	22 49.7	20	2 9 30.67	19 973	13 9 54.7	132.64	0 16.6
21	22 44 28.91	+ 14.553	− 10 24 6.3	+ 80.70	22 51.6	21	2 17 31.27	+ 20.069	+ 14 2 30.0	+130.21	0 20.7
22	22 50 19.88	14.694	9 51 12.6	83.77	22 53.6	22	2 25 33.69	20.128	14 54 0.7	127.25	0 24.8
23	22 56 14.22	14.834	9 17 5.6	86.80	22 55.6	23	2 33 36.96	20.140	15 44 14.0	123.77	0 28.9
24	23 2 11.91	14.973	8 41 46.3	89.81	22 57.7	24	2 41 40.02	20.108	16 32 57.7	119.78	0 33.1
25	23 8 12.94	15.113	8 5 15.0	92.79	22 59.8	25	2 49 41.74	20.028	17 19 59.9	115.31	0 37.2
26	23 14 17.36	+ 15.255	− 7 27 32.8	+ 95.73	23 2.0	26	2 57 40.94	+ 19.897	+ 18 5 9.7	+110.42	0 41.2
27	23 20 25.20	15.399	6 48 40.3	98.64	23 4.3	27	3 5 36.38	19.715	18 48 17.3	105.15	0 45.2
28	23 26 36.54	15.546	6 8 38.6	101.50	23 6 6	28	3 13 26.86	19.483	19 29 14.4	99.55	0 49.1
29	23 32 51 45	15.697	5 27 28.4	104.34	23 9.0	29	3 21 11.20	19.203	20 7 53.8	93.70	0 52.9
30	23 39 10.02	15.852	4 45 10.8	107.12	23 11.4	30	3 28 48.24	18.875	20 44 10.2	87.64	0 56.6
31	23 45 32.36	+ 16.012	− 4 1 47.0	+109.86	23 13.9	31	3 36 16.87	+ 18.503	+ 21 17 59.6	+ 81.45	1 0.1
32	23 51 58.63	+ 16.178	− 3 17 18.0	+112.54	23 16.5	32	3 43 36.03	+ 18.088	+ 21 49 19.5	+ 75.19	1 3.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	3.6″	3.3″	3.1″	3.0″	2.8″	2.7″	Semidiameter . .	2.6″	2.5″	2.5″	2.5″	2.6″	2.7″
Hor. Parallax . .	9.5	8.8	8.3	7.8	7.4	7.1	Hor. Parallax . .	6.9	6.7	6.6	6.6	6.8	7.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	3 36 16.87	+ 18.503	+ 21 17 59.6	+ 81.45	1 0.1	1	5 18 5.23	− 3.701	+ 21 57 8.5	− 47.29	0 39.4
2	3 43 36.03	18.068	21 49 19.5	75.19	1 3.5	2	5 16 29.78	4.240	21 38 3.7	48.04	0 33.9
3	3 50 44.74	17.633	22 18 8.6	68.91	1 6.7	3	5 14 42.29	4.703	21 18 45.5	48.40	0 28.2
4	3 57 42.12	17.143	22 44 27.2	62 65	1 9.7	4	5 12 44.71	5.082	20 59 23.7	48.34	0 22.3
5	4 4 27.34	16.619	23 8 16.2	56.45	1 12.5	5	5 10 39.09	5.372	20 40 8.7	47.84	0 16.3
6	4 10 59.59	+ 16.064	+ 23 29 37.5	+ 50 35	1 15.1	6	5 8 27.64	− 5.566	+ 20 21 11.2	− 46.87	0 10.2
7	4 17 18.17	15.479	23 48 34.1	44.38	1 17.5	7	5 6 12.70	5.663	20 2 42.5	45.44	0 4.0 23 57.8
8	4 23 22.38	14.866	24 5 9.1	38.55	1 19.6	8	5 3 56.60	5.663	19 44 53.7	43.54	23 51.7
9	4 29 11.61	14.228	24 19 26.0	32.89	1 21.4	9	5 1 41.67	5.566	19 27 56.1	41.18	23 45.6
10	4 34 45.26	13.568	24 31 29.1	27.40	1 23.0	10	4 59 30.19	5.375	19 12 0.3	38.39	23 39.6
11	4 40 2.77	+ 12.886	+ 24 41 22.7	+ 22.09	1 24.4	11	4 57 24.39	− 5.094	+ 18 57 16.5	− 35.20	23 33.7
12	4 45 3.59	12.179	24 49 11.0	16.96	1 25.5	12	4 55 26.35	4.729	18 43 53.6	31.65	23 27.9
13	4 49 47.20	11.451	24 54 58.4	12.02	1 26.2	13	4 53 38.00	4.287	18 31 59.8	27.78	23 22.4
14	4 54 13.09	10.702	24 58 49.4	7.27	1 26.7	14	4 52 1.15	3.774	18 21 42.1	23.65	23 17.1
15	4 58 20.77	9.935	25 0 48.6	+ 2.70	1 26.9	15	4 50 37.36	3.200	18 13 6.0	19.32	23 12.0
16	5 2 9.80	+ 9.148	+ 25 1 0.2	− 1.70	1 26.8	16	4 49 27.99	− 2.573	+ 18 6 15.6	− 14.85	23 7.1
17	5 5 39.75	8.345	24 59 28.4	5.92	1 26.3	17	4 48 34.23	1.900	18 1 13.9	10.29	23 2.5
18	5 8 50.22	7.525	24 56 17.5	9.96	1 25.5	18	4 47 57.07	1.190	17 58 1.8	5.71	22 58.3
19	5 11 40.84	6.690	24 51 31.6	13.84	1 24.4	19	4 47 37.34	− 0.450	17 56 39.6	− 1.15	22 54.3
20	5 14 11.28	5.844	24 45 14.6	17.55	1 22.9	20	4 47 35.68	+ 0.315	17 57 6.2	+ 3.34	22 50.7
21	5 16 21.28	+ 4.987	+ 21 37 30.5	− 21.10	1 21.1	21	4 47 52.61	+ 1.098	+ 17 59 19.1	+ 7.71	22 47.3
22	5 18 10.62	4.124	24 28 23.3	24.48	1 18.9	22	4 48 28.48	1.893	18 3 15.1	11.92	22 44.3
23	5 19 39.20	3.258	24 17 56.9	27.70	1 16.5	23	4 49 23.56	2 698	18 8 50.0	15.95	22 41.6
24	5 20 46.99	2.392	24 6 15.3	30.74	1 13.7	24	4 50 38.03	3.509	18 15 58.8	19.75	22 39.2
25	5 21 34.09	1.535	23 53 22.8	33.60	1 10.5	25	4 52 12.01	4.322	18 24 36.0	23.30	22 37.1
26	5 22 0.75	+ 0.690	+ 23 39 23.8	− 36.28	1 7.0	26	4 54 5.51	+ 5.136	+ 18 34 35.2	+ 26.58	22 35.4
27	5 22 7.34	− 0.137	23 24 22.9	38.76	1 3.1	27	4 56 18.55	5.950	18 45 49.7	29.58	22 34.0
28	5 21 54.41	0.936	23 8 25.3	41.01	0 59.0	28	4 58 51.11	6.762	18 58 12.8	32.26	22 32.9
29	5 21 22.69	1.701	22 51 36.5	43.02	0 54.5	29	5 1 43.13	7.572	19 11 35.7	34.62	22 32.1
30	5 20 33.13	2.422	22 34 2.8	44.75	0 49.8	30	5 4 54.57	8.380	19 25 51.7	36.65	22 31.6
31	5 19 26.86	− 3.092	+ 22 15 51.0	− 46.18	0 44.7	31	5 8 25.35	+ 9.185	+ 19 40 52.1	+ 38.32	22 31.5
32	5 18 5.23	− 3.701	+ 21 57 8.5	− 47.29	0 39.4	32	5 12 15.41	+ 9.987	+ 19 56 28.2	+ 39.62	22 31.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	3″.0	3″.3	3″.7	4″.2	4″.8	5″.3	5″.8
Hor. Parallax . .	7.9	8.7	9.8	11.2	12.6	14.0	15.3

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	6″.0	6″.0	5″.7	5″.2	4″.7	4″.1
Hor. Parallax . .	16.0	16.0	15.2	13.9	12.4	11.0

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	5 8 25.35	+ 9.185	+ 19 40 52.1	+ 38.32	22 31.5	1	8 58 29.68	+ 20.816	+ 18 59 36.5	− 83.41	0 19.5
2	5 12 15.41	9.987	19 56 28.2	39.62	22 31.7	2	9 6 44.85	20.445	18 25 27.6	87.28	0 23.8
3	5 16 24.69	10.785	20 12 31.1	40.55	22 32.2	3	9 14 50.96	20.063	17 49 50.3	90.77	0 28.0
4	5 20 53.12	11.582	20 28 51.6	41.09	22 33.1	4	9 22 47.81	19.674	17 12 53.4	93.91	0 32.0
5	5 25 40.63	12.376	20 45 20.2	41.21	22 34.2	5	9 30 35.28	19.282	16 34 45.4	96.71	0 35.9
6	5 30 47.14	+ 13.166	+ 21 1 46.4	+ 40.91	22 35.7	6	9 38 13.35	+ 18.891	+ 15 55 34.0	− 99.18	0 39.6
7	5 36 12.54	13.950	21 18 0.2	40.17	22 37.5	7	9 45 42.06	18.504	15 15 27.1	101.38	0 43.1
8	5 41 56.70	14.727	21 33 50.7	38.97	22 39.5	8	9 53 1.53	18.121	14 34 31.6	103.23	0 46.5
9	5 47 59.42	15.497	21 49 6.7	37.29	22 41.9	9	10 0 11.91	17.745	13 52 54.0	104.85	0 49.7
10	5 54 20.47	16.254	22 3 36.7	35.13	22 44.6	10	10 7 13.38	17.378	13 10 40.6	106.22	0 52.8
11	6 0 59.54	+ 16.995	+ 22 17 8.9	+ 32.48	22 47.6	11	10 14 6.16	+ 17.021	+ 12 27 57.1	−107.37	0 55.8
12	6 7 56.19	17.718	22 29 31.4	29.31	22 50.9	12	10 20 50.49	16.674	11 44 48.7	108 30	0 58.6
13	6 15 9.88	18.416	22 40 31.6	25.63	22 54.5	13	10 27 26.60	16.337	11 1 20.2	109.04	1 1.2
14	6 22 39.91	19.082	22 49 57.6	21.46	22 58.3	14	10 33 54.76	16.011	10 17 36.4	109.59	1 3.7
15	6 30 25.47	19.708	22 57 37.7	16.80	23 2.3	15	10 40 15.20	15.695	9 33 41.4	109.97	1 6.1
16	6 38 25.54	+ 20.289	+ 23 3 20.5	+ 11.68	23 6.6	16	10 46 28.17	+ 15.388	+ 8 49 39.1	−110.20	1 8.4
17	6 46 38.94	20.818	23 6 55.2	6.14	23 11.1	17	10 52 33.89	15.091	8 5 33.2	110.28	1 10.6
18	6 55 4.33	21.287	23 8 12.1	+ 0.22	23 15.8	18	10 58 32.63	14.804	7 21 26.9	110.22	1 12.6
19	7 3 40.19	21.690	23 7 2.8	− 6.03	23 20.6	19	11 4 24.59	14.526	6 37 23.9	110.02	1 14.5
20	7 12 24.88	22.022	23 3 20.5	12.53	23 25.5	20	11 10 9.95	14.255	5 53 26.9	109.71	1 16.3
21	7 21 16.66	+ 22.280	+ 22 57 0.1	− 19.20	23 30.5	21	11 15 48.91	+ 13.993	+ 5 9 38.8	−109.28	1 18.0
22	7 30 13.69	22.461	22 47 58.4	25.96	23 35.6	22	11 21 21.66	13.738	4 26 2.4	108.74	1 19.6
23	7 39 14.17	22.565	22 36 14.2	32.79	23 40.7	23	11 26 48.36	13.488	3 42 40.3	108.08	1 21.1
24	7 48 16.26	22.595	22 21 48.3	39.42	23 45.8	24	11 32 9.12	13.242	2 59 35.1	107.33	1 22.5
25	7 57 18.21	22.555	22 4 43.6	45.96	23 50.9	25	11 37 24.06	13.003	2 16 49.3	106.48	1 23.8
26	8 6 18.37	+ 22.448	+ 21 45 3.8	− 52.29	23 55.9	26	11 42 33.28	+ 12 766	+ 1 34 25.3	−105.52	1 25.1
27	8 15 15.26	22.282	21 22 55.5	58.35		27	11 47 36.84	12.531	0 52 25.5	104.46	1 26.2
28	8 24 7.53	22.064	20 58 25.5	64.10	0 0.8	28	11 52 34.80	12.298	+ 0 10 52.1	103.30	1 27.2
29	8 32 54.00	21.802	20 31 41.7	69.49	0 5.7	29	11 57 27.17	12.066	− 0 30 12.3	102.04	1 28.1
30	8 41 33.70	21.501	20 2 52.9	74 51	0 10.5	30	12 2 13.95	11.832	1 10 45.3	100.68	1 28.9
31	8 50 5.80	+ 21.170	+ 19 32 8.1	− 79.16	0 15.1	31	12 6 55.09	+ 11.596	− 1 50 44.4	− 99.22	1 29.6
32	8 58 29.68	+ 20.816	+ 18 59 36.5	− 83.41	0 19.5	32	12 11 30.54	+ 11.357	− 2 30 6.9	− 97.64	1 30.3

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	3.″6	3.″2	2.″9	2.″7	2.″6	2.″5	Semidiameter . .	2.″5	2.″5	2.″6	2.″7	2.″8	2.″9
Hor. Parallax . .	9.7	8.6	7.8	7.1	6.8	6.6	Hor. Parallax . .	6.6	6.7	6.8	7.1	7.4	7.8

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	12 11 30.54	+ 11.357	– 2 30 6.9	– 97.64	1 30.3
2	12 16 0.19	11.113	3 8 50.4	95.96	1 30.9
3	12 20 23.90	10.862	3 46 52.1	94.16	1 31.3
4	12 24 41.49	10.603	4 24 9.1	92.94	1 31.7
5	12 28 52.77	10.335	5 0 38.3	90.18	1 31.9
6	12 32 57.48	+ 10.055	– 5 36 16.4	– 87.98	1 32.0
7	12 36 55.31	9.762	6 10 59.9	85.62	1 32.0
8	12 40 45.91	9.453	6 44 45.0	83.11	1 31.9
9	12 44 28.87	9.125	7 17 27.7	80.42	1 31.7
10	12 48 3.72	8.776	7 49 3.7	77.54	1 31.4
11	12 51 29.92	+ 8.404	– 8 19 28.0	– 74.45	1 30.8
12	12 54 46.89	8.005	8 48 35.5	71.14	1 30.1
13	12 57 53.94	7.577	9 16 20.5	67.57	1 29.3
14	13 0 50.33	7.116	9 42 36.5	63.72	1 28.3
15	13 3 35.23	6.619	10 7 16.7	59.57	1 27.1
16	13 6 7.71	+ 6.082	– 10 30 13.2	– 55.08	1 25.7
17	13 8 26.79	5 501	10 51 17.8	50.23	1 24.1
18	13 10 31.38	4.873	11 10 21.2	44.98	1 22.2
19	13 12 20.28	4.194	11 27 13.4	39.28	1 20.0
20	13 13 52.27	3.462	11 41 42.9	33.10	1 17.6
21	13 15 6.02	+ 2.674	– 11 53 37.8	– 26.39	1 14.9
22	13 16 0.19	1.830	12 2 45.0	19.11	1 11.8
23	13 16 33.41	+ 0.929	12 8 50.5	11.25	1 8.4
24	13 16 44.35	– 0.027	12 11 40.0	– 2.76	1 4.7
25	13 16 31.71	1.034	12 10 58.0	+ 6.36	1 0.5
26	13 15 54.40	– 2.081	– 12 6 29.7	+ 16 10	0 55.9
27	13 14 51.58	3.158	11 58 0.8	26.41	0 50.9
28	13 13 22.73	4.247	11 45 18.2	37.21	0 45.5
29	13 11 27.82	5.326	11 28 11.9	48.36	0 39.7
30	13 9 7.41	6.366	11 6 36.0	59.64	0 33.4
31	13 6 22.84	– 7.334	– 10 40 29.9	+ 70.81	0 26.7
32	13 3 16.26	– 8.192	– 10 10 0.9	+ 81.49	0 19.7

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	3″.1	3″.3	3″.6	3″.9	4″.3	4″.8
Hor. Parallax . .	8.2	8.8	9.5	10.4	11.5	12.6

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	13 6 22.84	– 7.334	– 10 40 29.9	+ 70.81	0 26.7
2	13 3 16.26	8.192	10 10 0.9	81.49	0 19.7
3	12 59 50.80	8.901	9 35 25.3	91.29	0 12.4
4	12 56 10.51	9.490	8 57 9.4	99.76	0 4.8 23 57.0
5	12 52 20.43	9.712	8 15 50.7	106.45	23 49.2
6	12 48 26.34	– 9.750	– 7 32 17.3	+110.92	23 41.5
7	12 44 34.60	9.515	6 47 26.7	112.84	23 33.9
8	12 40 51.84	9.001	6 2 22.8	112.01	23 26.5
9	12 37 24.69	8.218	5 18 12.7	108.35	23 19.5
10	12 34 19.34	7.190	4 36 3.3	101.99	23 12.9
11	12 31 41.25	– 5.952	– 3 56 56.7	+ 93.17	23 6.9
12	12 29 34.95	4.548	3 21 47.4	82.30	23 1.5
13	12 28 3.88	3.026	2 51 19.4	69.80	22 56.6
14	12 27 10.26	– 1.435	2 26 6.0	56.18	22 52.4
15	12 26 55.16	+ 0.177	2 6 28.1	41.92	22 48.8
16	12 27 18.59	+ 1.770	– 1 52 35.4	+ 27.47	22 45.9
17	12 28 19.67	3.308	1 44 28.1	+ 13.90	22 43.5
18	12 29 56.72	4.764	1 41 57.8	– 0.56	22 41.7
19	12 32 7.54	6.119	1 44 49.4	13.59	22 40.5
20	12 34 49.54	7.361	1 52 43.1	25.71	22 39.7
21	12 37 59.90	+ 8.485	– 2 5 15.4	– 36.80	22 39.3
22	12 41 35.76	9.485	2 22 1.0	46.82	22 39.3
23	12 45 34.24	10.369	2 42 33.8	55.74	22 39.6
24	12 49 52.60	11.143	3 6 27.8	63.58	22 40.3
25	12 54 28.29	11.814	3 33 17.4	70.39	22 41.2
26	12 59 18.94	+ 12.392	– 4 2 38.7	– 76.23	22 42.3
27	13 4 22.43	12.886	4 34 9.1	81.16	22 43.6
28	13 9 36.89	13.307	5 7 27.9	85.27	22 45.0
29	13 15 0.65	13.663	5 42 16.1	88.63	22 46.6
30	13 20 32.29	13.965	6 18 16.6	91.31	22 48.3
31	13 26 10.58	+ 14.219	– 6 55 14.0	– 93.39	22 50.1
32	13 31 54.48	+ 14.434	– 7 32 55.0	– 94 94	22 52.0

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	5″.1	5″.0	4″.6	3″.9	3″.3	3″.0
Hor. Parallax . .	13.4	13.2	11.9	10.2	8.8	7.8

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	13 31 54.48	+ 14.434	− 7 32 55.0	− 94.94	22 52.0	1	16 40 52.57	+ 16.780	− 23 23 12.0	− 45.57	0 0.9
2	13 37 43.13	14.615	8 11 7.1	96.01	22 53.9	2	16 47 36.14	16.851	23 40 49.7	42.57	0 3.7
3	13 43 35.79	14.768	8 49 39.7	96.65	22 55.9	3	16 54 21.39	16.920	23 57 14.8	39.51	0 6.5
4	13 49 31.84	14.899	9 28 23.3	96.92	22 57.9	4	17 1 8.27	16.986	24 12 25.7	36.39	0 9.3
5	13 55 30.81	15.012	10 7 9.5	96.88	23 0.0	5	17 7 56.72	17.050	24 26 21.2	33.22	0 12.2
6	14 1 32.31	+ 15.110	− 10 45 51.3	− 96.55	23 2.1	6	17 14 46.67	+ 17.111	− 24 38 59.6	− 29.98	0 15.1
7	14 7 36.01	15.196	11 24 21.9	95.96	23 4.3	7	17 21 38.02	17.168	24 50 19.7	26.69	0 18.0
8	14 13 41.65	15.273	12 2 35.7	95.15	23 6.5	8	17 28 30.68	17.230	25 0 20.1	23.34	0 21.0
9	14 19 49.05	15.343	12 40 27.5	94.14	23 8.7	9	17 35 24.54	17.267	25 8 59.4	19.93	0 23.9
10	14 25 58.07	15.408	13 17 53.1	92.95	23 10.9	10	17 42 19.47	17.309	25 16 16.2	16.46	0 26.9
11	14 32 8.61	+ 15.469	− 13 54 48.2	− 91.62	23 13.2	11	17 49 15.30	+ 17.343	− 25 22 9.2	− 12.94	0 29.9
12	14 38 20.59	15.528	14 31 9.6	90.14	23 15.5	12	17 56 11.85	17.369	25 26 37.1	9.37	0 32.9
13	14 44 33.96	15.586	15 6 54.0	88.54	23 17.8	13	18 3 8.93	17.386	25 29 38.7	5.75	0 35.9
14	14 50 48.72	15.644	15 41 58.3	86.81	23 20.1	14	18 10 6.30	17.393	25 31 12.8	− 2.09	0 38.9
15	14 57 4.85	15.701	16 16 20.0	84.98	23 22.4	15	18 17 3.71	17.389	25 31 18.6	+ 1.62	0 42.0
16	15 3 22.36	+ 15.759	− 16 49 56.8	− 83.06	23 24.8	16	18 24 0.88	+ 17.373	− 25 29 54.6	+ 5.37	0 45.0
17	15 9 41.29	15.818	17 22 46.3	81.05	23 27.2	17	18 30 57.48	17.342	25 27 0.4	9.16	0 48.1
18	15 16 1.65	15.879	17 54 46.7	78.96	23 29.6	18	18 37 53.14	17.294	25 22 34.9	12.97	0 51.0
19	15 22 23.48	15.941	18 25 55.9	76.79	23 32.1	19	18 44 47.45	17.229	25 16 37.9	16.80	0 53.9
20	15 28 46.81	16.004	18 56 12.0	74.54	23 34.6	20	18 51 39.97	17.144	25 9 8.5	20.64	0 56.9
21	15 35 11.70	+ 16.070	− 19 25 33.4	− 72.22	23 37.1	21	18 58 30.16	+ 17.035	− 25 0 7.2	+ 24.48	0 59.8
22	15 41 38.18	16.137	19 53 58.4	69.84	23 39.6	22	19 5 17.44	16.900	24 49 34.0	28.30	1 2.6
23	15 48 6.29	16.205	20 21 25.3	67.39	23 42.2	23	19 12 1.15	16.736	24 37 29.2	32.09	1 5.4
24	15 54 36.05	16.275	20 47 52.8	64.88	23 44.8	24	19 18 40.55	16.541	24 23 54.0	35.84	1 8.1
25	16 1 7.49	16.346	21 13 19.2	62.31	23 47.4	25	19 25 14.81	16.306	24 8 49.7	39.51	1 10.7
26	16 7 40.65	+ 16.418	− 21 37 42.9	− 59.67	23 50.0	26	19 31 42.98	+ 16.032	− 23 52 18.3	+ 43.08	1 13.3
27	16 14 15.55	16.490	22 1 2.7	56.97	23 52.7	27	19 38 3.99	15.709	23 34 22.6	46.53	1 15.7
28	16 20 52.19	16.563	22 23 16.9	54.20	23 55.4	28	19 44 16.60	15.333	23 15 6.0	49.82	1 17.9
29	16 27 30.58	16.635	22 44 24.1	51.38	23 58.1	29	19 50 19.48	14.896	22 54 33.1	52.90	1 20.0
30	16 34 10.71	16.708	23 4 23.0	48.51		30	19 56 11.06	14.390	22 32 48.9	55.73	1 21.9
31	16 40 52.57	+ 16.780	− 23 23 12.0	− 45.57	0 0.9	31	20 1 49.59	+ 13.807	− 22 10 0.5	+ 58.25	1 23.6
32	16 47 36.14	+ 16.851	− 23 40 49.7	− 42.57	0 3.7	32	20 7 13.12	+ 13.138	− 21 46 16.0	+ 60.40	1 25.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	2″.7	2″.5	2″.4	2″.4	2″.3	2″.3
Horizontal Parallax	7.1	6.7	6.4	6.2	6.1	6.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	2″.3	2″.3	2″.4	2″.5	2″.6	2″.8	3″.1
Hor. Parallax . .	6.1	6.2	6.4	6.6	7.0	7.5	8.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	16 25 43.25	+ 2.281	− 17 4 44.0	+ 6.04	21 39.8
2	16 26 42.30	2.638	17 2 42.4	4.12	21 37.0
3	16 27 49.79	2.984	17 1 25.7	2.29	21 34.3
4	16 29 5.47	3.320	17 0 51.7	+ 0.56	21 31.7
5	16 30 29.07	3.645	17 0 58.1	− 1.08	21 29.3
6	16 32 0.35	+ 3.959	− 17 1 42.6	− 2.62	21 27.0
7	16 33 39.04	4.263	17 3 2.8	4.05	21 24.8
8	16 35 24.91	4.557	17 4 56.3	5.39	21 22.8
9	16 37 17.72	4.841	17 7 20.9	6.63	21 20.9
10	16 39 17.23	5.116	17 10 14.2	7.78	21 19.1
11	16 41 23.21	+ 5.381	− 17 13 33.9	− 8.84	21 17.3
12	16 43 35.45	5.636	17 17 17.9	9.80	21 15.6
13	16 45 53.73	5.884	17 21 23.8	10.67	21 14.0
14	16 48 17.86	6.124	17 25 49.5	11.45	21 12.5
15	16 50 47.64	6.356	17 30 32.9	12.14	21 11.2
16	16 53 22.90	+ 6.580	− 17 35 31.8	− 12.75	21 10.0
17	16 56 3.44	6.797	17 40 44.2	13.27	21 8.8
18	16 58 49.11	7.007	17 46 8.1	13.71	21 7.7
19	17 1 39.74	7.210	17 51 41.5	14.07	21 6.6
20	17 4 35.17	7.407	17 57 22.6	14.35	21 5.6
21	17 7 35.24	+ 7.597	− 18 3 9.5	− 14.55	21 4.7
22	17 10 39.81	7.782	18 9 0.5	14.68	21 3.9
23	17 13 48.74	7.961	18 14 53.7	14.74	21 3.2
24	17 17 1.89	8.134	18 20 47.6	14.73	21 2.5
25	17 20 19.12	8.301	18 26 40.3	14.65	21 1.9
26	17 23 40.31	+ 8.463	− 18 32 30.4	− 14.51	21 1.4
27	17 27 5.31	8.619	18 38 16 2	14.30	21 0.9
28	17 30 34.00	8.770	18 43 56.3	14.03	21 0.5
29	17 34 6.25	8.915	18 49 29.2	13.70	21 0.2
30	17 37 41.93	9.056	18 54 53.6	13.31	20 59.9
31	17 41 20.93	+ 9.191	− 19 0 8.1	− 12.87	20 59.7
32	17 45 3.11	+ 9.322	− 19 5 11.3	− 12.38	20 59.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	24″.4	22″.5	20″.7	19″.1	17″.7	16″.4	15″.3
Hor. Parallax . .	25.3	23.3	21.4	19.8	18.3	17.0	15.9

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 45 3.11	+ 9.322	− 19 5 11.3	− 12.38	20 59.5
2	17 48 48.36	9.447	19 10 2.1	11.84	20 59.4
3	17 52 36.56	9.568	19 14 39.3	11.25	20 59.3
4	17 56 27.60	9.684	19 19 1.7	10.61	20 59.2
5	18 0 21.37	9.795	19 23 8.3	9.93	20 59.2
6	18 4 17.76	+ 9.902	− 19 26 57.9	− 9.20	20 59.2
7	18 8 16.66	10.004	19 30 29.6	8.43	20 59.3
8	18 12 17.97	10.102	19 33 42.4	7.62	20 59.4
9	18 16 21.58	10.197	19 36 35.4	6.78	20 59.6
10	18 20 27.42	10.287	19 39 7.6	5.90	20 59.8
11	18 24 35.37	+ 10.374	− 19 41 18.3	− 4.98	21 0.0
12	18 28 45.36	10.457	19 43 6.6	4.04	21 0.2
13	18 32 57.29	10.536	19 44 31.8	3.06	21 0.5
14	18 37 11.07	10.612	19 45 33.2	2.05	21 0.8
15	18 41 26.63	10.684	19 46 10.1	− 1.02	21 1.1
16	18 45 43.88	+ 10.753	− 19 46 21.8	+ 0.04	21 1.5
17	18 50 2.74	10.818	19 46 7.7	1.13	21 1.9
18	18 54 23.15	10.882	19 45 27.2	2.24	21 2.3
19	18 58 45.02	10.941	19 44 19.8	3.38	21 2.8
20	19 3 8.28	10.997	19 42 44.9	4.53	21 3.2
21	19 7 32.86	+ 11.050	− 19 40 42.1	+ 5.70	21 3.7
22	19 11 58.66	11.100	19 38 11.0	6.89	21 4.2
23	19 16 25.62	11 147	19 35 11.2	8.09	21 4.7
24	19 20 53.69	11.190	19 31 42.3	9.31	21 5.2
25	19 25 22.78	11.231	19 27 44.1	10 54	21 5.8
26	19 29 52.82	+ 11.269	− 19 23 16.1	+ 11.78	21 6.4
27	19 34 23.75	11.304	19 18 18.2	13.03	21 7.0
28	19 38 55.48	11.336	19 12 50.3	14.29	21 7.6
29	19 43 27.94	11.365	19 6 52.2	15.55	21 8.2
30	19 48 1.05	11.391	19 0 23.8	16.82	21 8.8
31	19 52 34.75	+ 11.415	− 18 53 25.0	+ 18.09	21 9.5
32	19 57 8.98	+ 11.436	− 18 45 55.6	+ 19.36	21 10.1

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter	14″.3	13″.5	12″.7	12″.0	11″.4
Horizontal Parallax . .	14.8	14.0	13.2	12.4	11.8

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 43 27.94	+ 11.365	− 19 6 52.2	+ 15.55	21 8.2
2	19 48 1.05	11 391	19 0 23.8	16.82	21 8.8
3	19 52 34.75	11.415	18 53 25.0	18.09	21 9.5
4	19 57 8.98	11.436	18 45 55.6	19.36	21 10.1
5	20 1 43.67	11.454	18 37 55.8	20.63	21 10.8
6	20 6 18.75	+ 11.469	− 18 29 25.4	+ 21.90	21 11.4
7	20 10 54.16	11.482	18 20 24.6	23.16	21 12.1
8	20 15 29.85	11.492	18 10 53.5	24.42	21 12.7
9	20 20 5.75	11.500	18 0 52.2	25.68	21 13.4
10	20 24 41.81	11.505	17 50 20.7	26.93	21 14.0
11	20 29 17.98	+ 11.509	− 17 39 19.3	+ 28.17	21 14.7
12	20 33 54.21	11.510	17 27 48.1	29.41	21 15.3
13	20 38 30.46	11.510	17 15 47.4	30.64	21 16.0
14	20 43 6.67	11.508	17 3 17.3	31.86	21 16.6
15	20 47 42.81	11.504	16 50 18.1	33.07	21 17.3
16	20 52 18.85	+ 11.499	− 16 36 50.0	+ 34.27	21 17.9
17	20 56 54.75	11.492	16 22 53.3	35.46	21 18.6
18	21 1 30.47	11.484	16 8 28.3	36.63	21 19.2
19	21 6 6.00	11.476	15 53 35.4	37.79	21 19.9
20	21 10 41.30	11.466	15 38 14.8	38.93	21 20.5
21	21 15 16.35	+ 11.455	− 15 22 27.0	+ 40.06	21 21.2
22	21 19 51.13	11.443	15 6 12.2	41.19	21 21.8
23	21 24 25.61	11.431	14 49 30.9	42.27	21 22.5
24	21 28 59.78	11.418	14 32 23.5	43.35	21 23.1
25	21 33 33.62	11.404	14 14 50.5	44.41	21 23.7
26	21 38 7.11	+ 11.389	− 13 56 52.2	+ 45.46	21 24.3
27	21 42 40.24	11.373	13 38 29.1	46.48	21 24.9
28	21 47 13.00	11.357	13 19 41.7	47.48	21 25.5
29	21 51 45.37	11.340	13 0 30.5	48.46	21 26.1
30	21 56 17.33	11.323	12 40 56.0	49.42	21 26.7
31	22 0 48.88	+ 11.306	− 12 20 58.8	+ 50.35	21 27.3
32	22 5 20.02	+ 11.288	− 12 0 39.5	+ 51.26	21 27.9

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	10″.8	10″.3	9″.9	9″.5	9″.1	8″.8
Hor. Parallax . .	11.2	10.7	10.2	9.8	9.4	9.1

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 5 20.02	+ 11.288	− 12 0 39.5	+ 51.26	21 27.9
2	22 9 50.74	11.270	11 39 58.6	52.15	21 28.4
3	22 14 21.02	11.252	11 18 56.6	53.02	21 29.0
4	22 18 50.87	11.234	10 57 34.0	53.86	21 29.5
5	22 23 20.28	11.216	10 35 51.6	54.68	21 30.1
6	22 27 49.25	+ 11.198	− 10 13 49.9	+ 55.47	21 30.6
7	22 32 17.79	11.180	9 51 29.4	56.24	21 31.1
8	22 36 45.90	11.162	9 28 50.8	56.98	21 31.6
9	22 41 13.57	11.144	9 5 54.7	57.70	21 32.1
10	22 45 40.82	11.127	8 42 41.6	58.39	21 32.6
11	22 50 7.66	+ 11 110	− 8 19 12.1	+ 59.06	21 33.1
12	22 54 34.11	11.094	7 55 26.9	59.70	21 33.6
13	22 59 0 18	11.078	7 31 26.6	60.32	21 34.1
14	23 3 25.88	11.063	7 7 11.7	60.92	21 34.6
15	23 7 51.23	11.049	6 42 42 9	61.49	21 35.1
16	23 12 16.24	+ 11.036	− 6 18 0.7	+ 62.03	21 35.6
17	23 16 40.95	11.024	5 53 5.8	62.55	21 36.1
18	23 21 5.37	11.012	5 27 58.7	63.04	21 36.5
19	23 25 29.54	11.001	5 2 40.1	63.51	21 37.0
20	23 29 53.46	10.992	4 37 10.6	63.95	21 37.4
21	23 34 17.18	+ 10.984	− 4 11 30.8	+ 64.36	21 37.9
22	23 38 40.72	10.977	3 45 41.3	64.75	21 38.3
23	23 43 4.09	10.971	3 19 42.8	65.11	21 38.8
24	23 47 27.32	10.966	2 53 35.8	65.45	21 39.2
25	23 51 50.45	10.962	2 27 21.1	65.76	21 39.6
26	23 56 13.51	+ 10 960	− 2 0 59.2	+ 66.05	21 40.0
27	0 0 36.51	10.959	1 34 30.8	66.31	21 40.4
28	0 4 59.49	10.958	1 7 56.4	66.54	21 40.9
29	0 9 22.48	10.959	0 41 16.9	66.74	21 41.3
30	0 13 45.50	10.961	− 0 14 32.8	66.92	21 41.8
31	0 18 8.59	+ 10.964	+ 0 12 15.1	+ 67.07	21 42.2
32	0 22 31.76	+ 10.968	+ 0 39 6.2	+ 67.19	21 42.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	8″.4	8″.1	7″.9	7″.6	7″.4	7″.2
Hor. Parallax . .	8.7	8.4	8.2	7.9	7.7	7.4

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	0 18 8.59	+ 10.964	+ 0 12 15.1	+ 67.07	21 42.4	1	2 37 16.82	+ 11.683	+ 13 34 38.2	+ 57.85	21 59.5
2	0 22 31.76	10.968	0 39 6.2	67.19	21 42.7	2	2 41 57.72	11.725	13 57 37.7	57.10	22 0.2
3	0 26 55.03	10.973	1 5 59.9	67.28	21 43.1	3	2 46 39.62	11.767	14 20 18.8	56.31	22 1.0
4	0 31 18.46	10.979	1 32 55.5	67.35	21 43.6	4	2 51 22.53	11.810	14 42 40.7	55.50	22 1.8
5	0 35 42.05	10.987	1 59 52.4	67.38	21 44.0	5	2 56 6.47	11.853	15 4 42.8	54.66	22 2.6
6	0 40 5.85	+ 10.996	+ 2 26 49.8	+ 67.39	21 44.5	6	3 0 51.46	+ 11.897	+ 15 26 24.2	+ 53.78	22 3.4
7	0 44 29.87	11.006	2 53 47.0	67.37	21 44.9	7	3 5 37.52	11.941	15 47 44.3	52.88	22 4.3
8	0 48 54.16	11.017	3 20 43.5	67.32	21 45.4	8	3 10 24.64	11.986	16 8 42.5	51.95	22 5.1
9	0 53 18.73	11.030	3 47 38.5	67.25	21 45.9	9	3 15 12.84	12.031	16 29 17.9	50.99	22 6.0
10	0 57 43.62	11.044	4 14 31.4	67.15	21 46.4	10	3 20 2.13	12.076	16 49 29.8	50.00	22 6.9
11	1 2 8.85	+ 11.059	+ 4 41 21.6	+ 67.02	21 46.9	11	3 24 52.51	+ 12.122	+ 17 9 17.7	+ 48.99	22 7.8
12	1 6 34.46	11.076	5 8 8.4	66.87	21 47.4	12	3 29 43.99	12.168	17 28 40.9	47.94	22 8.7
13	1 11 0.49	11.094	5 34 51.1	66.69	21 47.9	13	3 34 36.58	12.214	17 47 38.7	46.87	22 9.7
14	1 15 26.96	11.113	6 1 29.1	66.48	21 48.4	14	3 39 30.27	12.260	18 6 10.4	45.77	22 10.7
15	1 19 53.91	11.134	6 28 1.6	66.24	21 48.9	15	3 44 25.07	12.306	18 24 15.3	44.64	22 11.7
16	1 24 21.38	+ 11.156	+ 6 54 28.1	+ 65.97	21 49.4	16	3 49 20.99	+ 12.352	+ 18 41 52.8	+ 43.48	22 12.7
17	1 28 49.39	11.179	7 20 47.8	65.67	21 49.9	17	3 54 18.02	12.399	18 59 2.2	42.30	22 13.7
18	1 33 17.98	11.204	7 47 0.2	65.35	21 50.5	18	3 59 16.15	12.445	19 15 42.8	41.08	22 14.7
19	1 37 47.19	11.231	8 13 4.5	65.00	21 51.0	19	4 4 15.38	12.491	19 31 54.1	39.84	22 15.8
20	1 42 17.05	11.259	8 39 0.1	64.62	21 51.6	20	4 9 15.71	12.536	19 47 35.3	38.58	22 16.9
21	1 46 47.59	+ 11.288	+ 9 4 46.3	+ 64.21	21 52.2	21	4 14 17.12	+ 12.581	+ 20 2 45.9	+ 37.29	22 18.0
22	1 51 18.84	11.318	9 30 22 5	63.78	21 52.8	22	4 19 19.60	12.625	20 17 25.2	35.98	22 19.1
23	1 55 50.84	11.349	9 55 47.9	63.32	21 53.4	23	4 24 23.13	12.669	20 31 32.7	34.65	22 20.3
24	2 0 23.61	11.382	10 21 1.9	62.83	21 54.0	24	4 29 27.70	12.712	20 45 7.7	33.29	22 21.4
25	2 4 57.18	11.416	10 46 3.7	62.32	21 54.6	25	4 34 33.29	12.754	20 58 9.7	31.89	22 22.6
26	2 9 31.58	+ 11.451	+ 11 10 52.7	+ 61.77	21 55.3	26	4 39 39.88	+ 12.795	+ 21 10 38.1	+ 30.47	22 23.7
27	2 14 6.83	11.488	11 35 28.2	61.19	21 55.9	27	4 44 47.43	12.835	21 22 32.4	29.03	22 24.9
28	2 18 42.96	11.525	11 59 49.5	60.58	21 56.6	28	4 49 55.93	12.873	21 33 52.0	27.58	22 26.1
29	2 23 20.01	11.563	12 23 55.8	59.94	21 57.3	29	4 55 5.34	12.910	21 44 36.4	26.11	22 27.3
30	2 27 57.99	11.602	12 47 46.5	59.27	21 58.0	30	5 0 15.62	12.946	21 54 45.2	24.62	22 28.5
31	2 32 36.92	+ 11.642	+ 13 11 20.9	+ 58.57	21 58.7	31	5 5 26.74	+ 12.980	+ 22 4 17.8	+ 23.10	22 29.8
32	2 37 16.82	+ 11.683	+ 13 34 38.2	+ 57.85	21 59.5	32	5 10 38.66	+ 13.012	+ 22 13 13.8	+ 21.56	22 31.1

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	7″.0	6″.8	6″.6	6″.5	6″.3	6″.2	6″.1
Hor. Parallax . .	7.2	7.1	6.9	6.7	6.6	6.4	6.3

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	6″.0	5″.9	5″.8	5″.7	5″.6	5″.5
Hor. Parallax . .	6.2	6.1	6.0	5.9	5.8	5.7

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	5 5 26.74	+ 12.980	+ 22 4 17.8	+ 23.10	22 29.8
2	5 10 38.66	13.012	22 13 13.8	21.56	22 31.1
3	5 15 51.34	13.043	22 21 32.7	20.01	22 32.4
4	5 21 4.74	13.072	22 29 14.1	18.44	22 33.7
5	5 26 18.82	13.100	22 36 17.6	16.85	22 35.0
6	5 31 33.53	+ 13.126	+ 22 42 42.9	+ 15.25	22 36.3
7	5 36 48.82	13 149	22 48 29.7	13.63	22 37.6
8	5 42 4.64	13.170	22 53 37.5	12.00	22 38.9
9	5 47 20.95	13.189	22 58 6.2	10.36	22 40.3
10	5 52 37.70	13.206	23 1 55.3	8.72	22 41.6
11	5 57 54.83	+ 13.221	+ 23 5 4.7	+ 7.07	22 43.0
12	6 3 12.30	13.234	23 7 34.2	5.40	22 44.3
13	6 8 30.05	13.245	23 9 23.8	3.73	22 45.7
14	6 13 48.03	13.254	23 10 33.2	2.05	22 47.0
15	6 19 6.19	13.260	23 11 2.2	+ 0.36	22 48.4
16	6 24 24.48	+ 13.264	+ 23 10 50.7	− 1.33	22 49.7
17	6 29 42.84	13.266	23 9 58.6	3.02	22 51.1
18	6 35 1.22	13.266	23 8 25.8	4.71	22 52.5
19	6 40 19.58	13.264	23 6 12.4	6.40	22 53.9
20	6 45 37.86	13.260	23 3 18.4	8.09	22 55.3
21	6 50 56.02	+ 13.254	+ 22 59 43.8	− 9.78	22 56.6
22	6 56 14.00	13.245	22 55 28.7	11.47	22 58.0
23	7 1 31.75	13.234	22 50 33.2	13.15	22 59.3
24	7 6 49.21	13.221	22 44 57.4	14.83	23 0.7
25	7 12 6.34	13.206	22 38 41.5	16.50	23 2.0
26	7 17 23.09	+ 13.189	+ 22 31 45.7	− 18.17	23 3.3
27	7 22 39.41	13.170	22 24 10.2	19.82	23 4.6
28	7 27 55.26	13.149	22 15 55.1	21.46	23 5.9
29	7 33 10.59	13.127	22 7 0.8	23.08	23 7.2
30	7 38 25.35	13.102	21 57 27.5	24.69	23 8.5
31	7 43 39.49	+ 13.076	+ 21 47 15.7	− 26.29	23 9.8
32	7 48 52.98	+ 13.048	+ 21 36 25.7	− 27.87	23 11.1

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	5″.4	5″.4	5″.3	5″.2	5″.2	5″.2
Hor. Parallax . .	5.6	5.6	5.5	5.4	5.4	5.3

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	7 48 52.98	+ 13.048	+ 21 36 25.7	− 27.87	23 11.1
2	7 54 5.78	13.018	21 24 57.8	29.44	23 12.3
3	7 59 17.83	12.987	21 12 52.4	30.99	23 13.6
4	8 4 29.11	12.954	21 0 9.9	32.53	23 14.8
5	8 9 39.58	12.920	20 46 50.9	34.05	23 16.0
6	8 14 49.22	+ 12.884	+ 20 32 55.7	− 35.55	23 17.2
7	8 19 57.98	12.847	20 18 24.9	37.03	23 18.4
8	8 25 5.85	12.809	20 3 18.9	38.48	23 19.6
9	8 30 12.80	12.770	19 47 38.2	39.91	23 20.8
10	8 35 18.80	12.730	19 31 23.4	41.32	23 21.9
11	8 40 23.83	+ 12.689	+ 19 14 35.1	− 42.71	23 23.0
12	8 45 27.88	12.648	18 57 13.7	44.08	23 24.1
13	8 50 30.94	12.606	18 39 19.9	45.42	23 25.2
14	8 55 33.00	12.564	18 20 54.2	46.73	23 26.3
15	9 0 34.05	12.522	18 1 57.2	48.02	23 27.4
16	9 5 34.08	+ 12.480	+ 17 42 29.6	− 49.28	23 28.4
17	9 10 33.08	12.438	17 22 31.9	50.52	23 29.4
18	9 15 31.06	12.395	17 2 4.8	51.73	23 30.4
19	9 20 28.02	12.353	16 41 8.9	52.92	23 31.4
20	9 25 23.95	12.310	16 19 44.9	54.08	23 32.4
21	9 30 18.87	+ 12.267	+ 15 57 53.4	− 55.22	23 33.4
22	9 35 12.78	12.224	15 35 35.0	56.32	23 34.3
23	9 40 5.69	12.182	15 12 50.5	57.40	23 35.2
24	9 44 57.62	12.141	14 49 40.6	58.44	23 36.1
25	9 49 48.56	12.101	14 26 5.9	59.45	23 37.0
26	9 54 38.53	+ 12.062	+ 14 2 7.2	− 60.44	23 37.9
27	9 59 27.56	12.023	13 37 45.1	61.40	23 38.8
28	10 4 15.65	11.984	13 13 0.3	62.33	23 39.6
29	10 9 2.82	11.946	12 47 53.6	63.23	23 40.5
30	10 13 49.09	11.909	12 22 25.6	64.10	23 41.3
31	10 18 34.48	+ 11.873	+ 11 56 37.2	− 64.94	23 42.1
32	10 23 19.01	+ 11.837	+ 11 30 29.0	− 65.75	23 42.9

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	5″.1	5″.1	5″.1	5″.0	5″.0	5″.0
Hor. Parallax . .	5.3	5.3	5.2	5.2	5.2	5.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 23 19.01	+ 11.837	+ 11 30 29.0	− 65.75	23 42.9	1	12 41 27.87	+ 11.427	− 3 6 35.5	− 75.88	0 1.9
2	10 28 2.68	11.803	11 4 1.8	66.53	23 43.7	2	12 46 2.26	11.439	3 36 54.9	75.74	0 2.6
3	10 32 45.54	11.769	10 37 16.3	67.28	23 44.4	3	12 50 36.96	11.453	4 7 10.6	75.57	0 3.2
4	10 37 27.61	11.737	10 10 13.3	67.99	23 45.2	4	12 55 12.00	11.468	4 37 21.9	75.37	0 3.9
5	10 42 8.92	11.705	9 42 53.4	68.67	23 45.9	5	12 59 47.44	11.485	5 7 28.0	75.12	0 4.5
6	10 46 49.48	+ 11.675	+ 9 15 17.3	− 69.32	23 46.6	6	13 4 23.31	+ 11.504	− 5 37 28.0	− 74.87	0 5.2
7	10 51 29.33	11.646	8 47 25.9	69.95	23 47.3	7	13 8 59.66	11.524	6 7 21.3	74.57	0 5.8
8	10 56 8.51	11.618	8 19 19.8	70.55	23 48.0	8	13 13 36.51	11.546	6 37 7.0	74.24	0 6.5
9	11 0 47.04	11.592	7 50 59.8	71.11	23 48.7	9	13 18 13.91	11.570	7 6 44.4	73.88	0 7.2
10	11 5 24.96	11.567	7 22 26.6	71.65	23 49.4	10	13 22 51.89	11.595	7 36 12.8	73.49	0 7.9
11	11 10 2.30	+ 11.544	+ 6 53 40.9	− 72.15	23 50.1	11	13 27 30.49	+ 11.622	− 8 5 31.4	− 73.06	0 8.6
12	11 14 39.09	11.522	6 24 43.5	72.63	23 50.8	12	13 32 9.77	11.651	8 34 39.3	72.60	0 9.3
13	11 19 15.38	11.502	5 55 35.1	73.07	23 51.4	13	13 36 49.75	11.681	9 3 35.9	72.11	0 10.0
14	11 23 51.20	11.483	5 26 16.3	73.49	23 52.1	14	13 41 30.47	11.713	9 32 20.3	71.59	0 10.7
15	11 28 26.59	11.466	4 56 48.0	73.87	23 52.7	15	13 46 11.97	11.746	10 0 51.8	71.03	0 11.4
16	11 33 1.59	+ 11.451	+ 4 27 10.8	− 74.23	23 53.3	16	13 50 54.30	+ 11.781	− 10 29 9.6	− 70.44	0 12.2
17	11 37 36.24	11.437	3 57 25.5	74.55	23 53.9	17	13 55 37.48	11.818	10 57 12.8	69.82	0 13.0
18	11 42 10.57	11.425	3 27 32.7	74.85	23 54.5	18	14 0 21.56	11.856	11 25 0.7	69.17	0 13.8
19	11 46 44.63	11.414	2 57 33.2	75.11	23 55.2	19	14 5 6.56	11.896	11 52 32.6	68.48	0 14.6
20	11 51 18.47	11.406	2 27 27.8	75.35	23 55.8	20	14 9 52.52	11.936	12 19 47.7	67.76	0 15.5
21	11 55 52.13	+ 11.399	+ 1 57 17.2	− 75.55	23 56.4	21	14 14 39.48	+ 11.978	− 12 46 45.2	− 67.01	0 16.3
22	12 0 25.65	11.394	1 27 2.0	75.72	23 57.0	22	14 19 27.46	12.021	13 13 24.3	66.23	0 17.2
23	12 4 59.07	11.391	0 56 43.1	75.86	23 57.7	23	14 24 16.49	12.065	13 39 44.1	65.41	0 18.1
24	12 9 32.43	11.390	+ 0 26 21.1	75.97	23 58.3	24	14 29 6.60	12.111	14 5 43.8	64.56	0 19.0
25	12 14 5.78	11.390	− 0 4 3.2	76.05	23 58.9	25	14 33 57.82	12.157	14 31 22.6	63.67	0 19.9
26	12 18 39.15	+ 11.392	− 0 34 29.0	− 76.10	23 59.5	26	14 38 50.16	+ 12.205	− 14 56 39.8	− 62.75	0 20.8
27	12 23 12.60	11.396	1 4 55.7	76.12		27	14 43 43.65	12.253	15 21 34.7	61.80	0 21.7
28	12 27 46.15	11.401	1 35 22.4	76.11	0 0.1	28	14 48 38.32	12.302	15 46 6.3	60.82	0 22.7
29	12 32 19.86	11.408	2 5 48.5	76.06	0 0.7	29	14 53 34.17	12.352	16 10 13.9	59.80	0 23.7
30	12 36 53.75	11.417	2 36 13.1	75.99	0 1.3	30	14 58 31.22	12.402	16 33 56.6	58.75	0 24.7
31	12 41 27.87	+ 11.427	− 3 6 35.5	− 75.88	0 1.9	31	15 3 29.48	+ 12.453	− 16 57 13.5	− 57.66	0 25.7
32	12 46 2.26	+ 11.439	− 3 36 54.9	− 75.74	0 2.6	32	15 8 28.96	+ 12.504	− 17 20 3.9	− 56.54	0 26.8

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	5″.0	5″.0	5″.0	5″.0	5″.0	5″.0	Semidiameter . .	5″.0	5″.0	5″.0	5″.0	5″.0	5″.1
Hor. Parallax . .	5.2	5.1	5.1	5.1	5.1	5.1	Hor. Parallax . .	5.2	5.2	5.2	5.2	5.2	5.3

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

	NOVEMBER.						DECEMBER.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	15 8 28.96	+ 12.504	– 17 20 3.9	– 56.54	0 26.8	1	17 46 54.19	+ 13.710	– 24 19 50.8	– 9.70	1 7.0
2	15 13 29.67	12.555	17 42 27.0	55.38	0 27.9	2	17 52 23.37	13.722	24 23 21.3	7.83	1 8.5
3	15 18 31.62	12.606	18 4 22.1	54 19	0 29.0	3	17 57 52.80	13.730	24 26 6.8	5.96	1 10.1
4	15 23 34.80	12.658	18 25 48.3	52.97	0 30.1	4	18 3 22.40	13.736	24 28 7.3	4.08	1 11.6
5	15 28 39.21	12.709	18 46 44.9	51.72	0 31.2	5	18 8 52.11	13.739	24 29 22.7	2.20	1 13.2
6	15 33 44.86	+ 12.761	– 19 7 10.8	– 50.44	0 32.3	6	18 14 21.84	+ 13.739	– 24 29 52.9	– 0.31	1 14.7
7	15 38 51.74	12.812	19 27 5.7	49.13	0 33.5	7	18 19 51.54	13.736	24 29 37.7	+ 1.57	1 16.3
8	15 43 59.84	12.863	19 46 28.6	47.78	0 34.7	8	18 25 21.14	13.730	24 28 37.3	3.46	1 17.8
9	15 49 9.16	12.914	20 5 18.8	46.40	0 35.9	9	18 30 50.56	13.721	24 26 51.6	5.34	1 19.4
10	15 54 19.70	12.964	20 23 35.5	44.99	0 37.1	10	18 36 19.75	13.710	24 24 20.8	7.22	1 20.9
11	15 59 31.42	+ 13.013	– 20 41 18.1	– 43.55	0 38.4	11	18 41 48.63	+ 13.696	– 24 21 4.9	+ 9.10	1 22.5
12	16 4 44.32	13.062	20 58 25.8	42.08	0 39.7	12	18 47 17.15	13.679	24 17 4.1	10.97	1 24.0
13	16 9 58.39	13.110	21 14 57.9	40.58	0 41.0	13	18 52 45.22	13.660	24 12 18.4	12.84	1 25.6
14	16 15 13.60	13.157	21 30 53.7	39.06	0 42.3	14	18 58 12.79	13.638	24 6 48.1	14.69	1 27.1
15	16 20 29.93	13.203	21 46 12.7	37.51	0 43.6	15	19 3 39.80	13.613	24 0 33.5	16.53	1 28.6
16	16 25 47.35	+ 13.248	– 22 0 54.1	– 35.93	0 44.9	16	19 9 6.20	+ 13.586	– 23 53 34.9	+ 18.36	1 30.1
17	16 31 5.84	13.292	22 14 57 3	34.33	0 46.3	17	19 14 31.93	13.557	23 45 52.4	20.18	1 31.6
18	16 36 25.35	13.334	22 28 21.7	32.70	0 47.7	18	19 19 56.93	13.525	23 37 26.4	21.98	1 33.1
19	16 41 45.88	13.375	22 41 6.7	31.05	0 49.1	19	19 25 21.14	13.492	23 28 17.3	23.77	1 34.5
20	16 47 7.38	13.415	22 53 11.7	29.37	0 50.5	20	19 30 44.51	13.456	23 18 25.5	25.54	1 35.9
21	16 52 29.80	+ 13.453	– 23 4 36.2	– 27.67	0 52.0	21	19 36 7.00	+ 13.418	– 23 7 51.5	+ 27.30	1 37.3
22	16 57 53.11	13.489	23 15 19.7	25.95	0 53.4	22	19 41 28.55	13.378	22 56 35.6	29.04	1 38.7
23	17 3 17.26	13.523	23 25 21.7	24.21	0 54.9	23	19 46 49.12	13.336	22 44 38.4	30.75	1 40.1
24	17 8 42.19	13.555	23 34 41.6	22.45	0 56.3	24	19 52 8.67	13.292	22 32 0.3	32.44	1 41.5
25	17 14 7.86	13.585	23 43 18.9	20.67	0 57.8	25	19 57 27.15	13.247	22 18 41.9	34.11	1 42.9
26	17 19 34.21	+ 13.612	– 23 51 13.4	– 18.88	0 59.3	26	20 2 44.52	+ 13.200	– 22 4 43.7	+ 35.75	1 44.3
27	17 25 1.20	13.637	23 58 24.7	17.07	1 0.8	27	20 8 0.74	13.152	21 50 6.3	37.37	1 45.6
28	17 30 28.75	13.659	24 4 52.4	15.25	1 2.3	28	20 13 15.78	13.102	21 34 50.3	38.96	1 46.9
29	17 35 56.81	13.679	24 10 36.2	13.41	1 3.9	29	20 18 29.61	13.050	21 18 56.4	40.53	1 48.2
30	17 41 25.31	13.696	24 15 35.7	11.56	1 5.4	30	20 23 42.20	12.998	21 2 25.2	42.07	1 49.5
31	17 46 54.19	+ 13.710	– 24 19 50.8	– 9.70	1 7.0	31	20 28 53.50	+ 12.944	– 20 45 17.3	+ 43.59	1 50.7
32	17 52 23.37	+ 13.722	– 24 23 21.3	– 7.83	1 8.5	32	20 34 3.50	+ 12.889	– 20 27 33.4	+ 45.07	1 51.9

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	5″.1	5″.1	5″.2	5″.2	5″.3	5″.3
Horizontal Parallax	5.3	5.3	5.4	5.4	5.4	5.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	5″.4	5″.4	5″.5	5″.5	5″.6	5″.7	5″.8
Hor. Parallax . .	5.5	5.6	5.7	5.7	5.8	5.9	6.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	18 21 58.29	+ 8.298	− 24 6 13.1	+ 3.10	23 38.2
2	18 25 17.49	8.303	24 4 50.8	3.77	23 37.6
3	18 28 36.82	8.307	24 3 12.4	4.43	23 36.9
4	18 31 56.24	8.311	24 1 18.1	5.10	23 36.3
5	18 35 15.74	8.314	23 59 7.7	5.77	23 35.7
6	18 38 35.31	+ 8.316	− 23 56 41.3	+ 6.43	23 35.1
7	18 41 54.92	8.318	23 53 59.0	7.09	23 34.5
8	18 45 14.56	8.318	23 51 0.7	7.76	23 33.8
9	18 48 34.21	8.319	23 47 46.5	8.42	23 33.2
10	18 51 53.86	8.318	23 44 16.3	9.09	23 32.6
11	18 55 13.48	+ 8.317	− 23 40 30.3	+ 9.75	23 32.0
12	18 58 33.07	8.315	23 36 28.4	10.41	23 31.4
13	19 1 52.60	8.312	23 32 10.6	11.07	23 30.8
14	19 5 12.06	8.309	23 27 37.0	11.73	23 30.1
15	19 8 31.44	8.305	23 22 47.7	12 38	23 29.5
16	19 11 50.71	+ 8.301	− 23 17 42.6	+ 13.04	23 28.9
17	19 15 9 87	8.296	23 12 21.9	13 69	23 28.3
18	19 18 28.91	8.290	23 6 45.6	14.33	23 27.6
19	19 21 47.81	8.284	23 0 53.8	14.98	23 27.0
20	19 25 6.55	8.278	22 54 46.5	15.63	23 26.4
21	19 28 25 13	+ 8.271	− 22 48 23.8	+ 16.27	23 25.7
22	19 31 43.53	8.263	22 41 45.7	16.90	23 25.1
23	19 35 1.74	8.255	22 34 52.4	17.54	23 24 5
24	19 38 19.76	8.247	22 27 43.9	18.17	23 23.8
25	19 41 37.58	8.238	22 20 20.3	18.79	23 23.2
26	19 44 55.18	+ 8.228	− 22 12 41.8	+ 19.41	23 22.5
27	19 48 12.54	8.218	22 4 48.2	20.03	23 21.9
28	19 51 29.66	8.208	21 56 39.9	20.65	23 21.2
29	19 54 46.54	8.198	21 48 16.9	21.26	23 20.5
30	19 58 3.16	8.187	21 39 39.3	21.87	23 19.9
31	20 1 19.52	+ 8.176	− 21 30 47.2	+ 22.47	23 19.2
32	20 4 35.60	+ 8.164	− 21 21 40.8	+ 23.06	23 18.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	2.″1	2.″1	2.″1	2.″1	2.″1	2.″1	2.″1
Hor. Parallax . .	3.7	3.7	3.7	3.7	3.7	3.7	3.7

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 4 35.60	+ 8.164	− 21 21 40.8	+ 23.06	23 18.5
2	20 7 51.39	8.152	21 12 20.2	23.65	23 17.8
3	20 11 6.88	8.139	21 2 45.5	24.23	23 17.2
4	20 14 22.06	8.126	20 52 56.9	24.81	23 16.5
5	20 17 36.93	8.112	20 42 54.4	25.39	23 15.8
6	20 20 51.46	+ 8.098	− 20 32 38.3	+ 25.95	23 15.1
7	20 24 5.65	8.084	20 22 8.6	26.51	23 14.3
8	20 27 19.50	8.070	20 11 25.6	27.06	23 13.6
9	20 30 32.99	8.055	20 0 29.4	27.61	23 12.9
10	20 33 46.11	8.039	19 49 20.2	28.15	23 12.2
11	20 36 58.87	+ 8.024	− 19 37 58.1	+ 28.69	23 11.4
12	20 40 11.25	8.008	19 26 23.2	29.22	23 10.7
13	20 43 23.24	7.992	19 14 35.7	29.74	23 9.9
14	20 46 34.84	7.975	19 2 35.8	30.25	23 9.2
15	20 49 46.05	7.958	18 50 23.7	30.75	23 8.4
16	20 52 56.85	+ 7.942	− 18 37 59.6	+ 31.25	23 7.7
17	20 56 7.25	7.925	18 25 23.5	31.75	23 6.9
18	20 59 17.26	7.909	18 12 35.7	32.24	23 6.1
19	21 2 26.86	7.892	17 59 36.2	32.72	23 5.3
20	21 5 36.06	7.875	17 46 25.3	33.19	23 4.5
21	21 8 44.85	+ 7.858	− 17 33 3.2	+ 33.65	23 3.7
22	21 11 53.23	7.841	17 19 30.0	34.11	23 2.9
23	21 15 1.20	7.824	17 5 46.0	34.56	23 2.1
24	21 18 8.77	7.807	16 51 51.2	35.00	23 1.3
25	21 21 15.93	7.790	16 37 45.9	35.44	23 0.4
26	21 24 22.69	+ 7.773	− 16 23 30.2	+ 35.87	22 59.6
27	21 27 29.05	7.757	16 9 4.2	36.29	22 58.8
28	21 30 35.00	7.740	15 54 28.4	36.70	22 57.9
29	21 33 40.55	7.723	15 39 42.8	37.10	22 57.0
30	21 36 45.69	7.706	15 24 47.5	37.50	22 56.2
31	21 39 50.43	+ 7.689	− 15 9 42.9	+ 37.88	22 55.3
32	21 42 54.77	+ 7.672	− 14 54 29.1	+ 38.26	22 54.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	2.″2	2.″2	2.″2	2.″2	2.″2	2.″2
Hor. Parallax . . .	3.8	3.8	3.8	3.8	3.8	3.9

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 33 40.55	+ 7.723	− 15 39 42.8	+ 37.10	22 57.0
2	21 36 45.69	7.706	15 24 47.5	37.50	22 56.2
3	21 39 50.43	7.689	15 9 42.9	37.88	22 55.3
4	21 42 54.77	7.672	14 54 29.1	38.26	22 54.4
5	21 45 58.70	7.655	14 39 6.3	38.63	22 53.6
6	21 49 2.23	+ 7.639	− 14 23 34.8	+ 38.99	22 52.7
7	21 52 5.36	7.622	14 7 54.6	39.35	22 51.8
8	21 55 8.08	7.605	13 52 6.1	39.69	22 50.9
9	21 58 10.41	7.589	13 36 9.4	40.03	22 50.0
10	22 1 12.33	7.572	13 20 4.7	40.36	22 49.0
11	22 4 13.86	+ 7.555	− 13 3 52.2	+ 40.67	22 48.1
12	22 7 14.99	7.539	12 47 32.4	40.98	22 47.2
13	22 10 15.72	7.523	12 31 5.2	41.28	22 46.3
14	22 13 16.07	7.506	12 14 30.7	41.58	22 45.3
15	22 16 16.01	7.490	11 57 49.4	41.86	22 44.4
16	22 19 15.60	+ 7.475	− 11 41 1.3	+ 42.14	22 43.4
17	22 22 14.80	7.459	11 24 6.7	42.41	22 42.5
18	22 25 13.62	7.444	11 7 5.7	42.67	22 41.5
19	22 28 12.08	7.429	10 49 58.6	42.92	22 40.5
20	22 31 10.19	7.414	10 32 45.5	43.17	22 39.5
21	22 34 7.94	+ 7.399	− 10 15 26.5	+ 43.40	22 38.6
22	22 37 5.34	7.385	9 58 2.3	43.63	22 37.6
23	22 40 2.41	7.371	9 40 32.5	43.85	22 36.6
24	22 42 59.15	7.357	9 22 57.5	44.06	22 35.6
25	22 45 55.56	7.344	9 5 17.5	44.27	22 34.6
26	22 48 51.66	+ 7.331	− 8 47 32.7	+ 44.46	22 33.5
27	22 51 47.45	7.318	8 29 43.3	44.65	22 32.5
28	22 54 42.94	7.306	8 11 49.4	44.83	22 31.5
29	22 57 38.13	7.294	7 53 51.5	45.00	22 30.5
30	23 0 33.03	7.282	7 35 49.5	45.16	22 29.4
31	23 3 27.66	+ 7.270	− 7 17 43.7	+ 45.31	22 28.4
32	23 6 22.02	+ 7.258	− 6 59 34.4	+ 45.46	22 27.4

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	2″.2	2″.2	2″.2	2″.2	2″.3	2″.3
Hor. Parallax . .	3.9	3.9	3.9	3.9	4.0	4.0

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 6 22.02	+ 7.258	− 6 59 34.4	+ 45.46	22 27.4
2	23 9 16.10	7.247	6 41 21.6	45.60	22 26.3
3	23 12 9.92	7.237	6 23 5.6	45.73	22 25.3
4	23 15 3.49	7.227	6 4 46.7	45.85	22 24.2
5	23 17 56.80	7.216	5 46 25.0	45.96	22 23.2
6	23 20 49.86	+ 7.206	− 5 28 0.8	+ 46.06	22 22.1
7	23 23 42.68	7.196	5 9 34.2	46.15	22 21.0
8	23 26 35.26	7.186	4 51 5.5	46.23	22 20.0
9	23 29 27.61	7.177	4 32 34.9	46.31	22 18.9
10	23 32 19.74	7.168	4 14 2.5	46.38	22 17.8
11	23 35 11.65	+ 7.159	− 3 55 28.6	+ 46.44	22 16.7
12	23 38 3.35	7.150	3 36 53.3	46.50	22 15.7
13	23 40 54.85	7.142	3 18 16.8	46.54	22 14.6
14	23 43 46.15	7.134	2 59 39.4	46.57	22 13.5
15	23 46 37.25	7.126	2 41 1.2	46.60	22 12.4
16	23 49 28.17	+ 7.118	− 2 22 22.5	+ 46.62	22 11.3
17	23 52 18.92	7.111	2 3 43.3	46.64	22 10.2
18	23 55 9.51	7.105	1 45 3.9	46.64	22 9.1
19	23 57 59.94	7.099	1 26 24.4	46.64	22 8.0
20	0 0 50.23	7.093	1 7 45.0	46.64	22 6.9
21	0 3 40.39	+ 7.087	− 0 49 6.0	+ 46.62	22 5.8
22	0 6 30.42	7.082	0 30 27.4	46.59	22 4.7
23	0 9 20.33	7.078	− 0 11 49.4	46.56	22 3.6
24	0 12 10.13	7.073	+ 0 6 47.7	46.52	22 2.4
25	0 14 59.84	7.069	0 25 23.8	46.48	22 1.3
26	0 17 49.45	+ 7.066	+ 0 43 58.7	+ 46.42	22 0.2
27	0 20 38.98	7.062	1 2 32.2	46.36	21 59.1
28	0 23 28.43	7.059	1 21 4.1	46.29	21 58.0
29	0 26 17.82	7.057	1 39 34.3	46.22	21 56.9
30	0 29 7.14	7.054	1 58 2.6	46.13	21 55.7
31	0 31 56.41	+ 7.052	+ 2 16 28.8	+ 46.04	21 54.6
32	0 34 45.62	+ 7.050	+ 2 34 52.6	+ 45.94	21 53.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	2″.3	2″.3	2″.3	2″.3	2″.4	2″.4
Hor. Parallax . .	4.0	4.0	4.1	4.1	4.1	4.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	0 31 56.41	+ 7.052	+ 2 16 28.8	+ 46.04	21 54.6	1	1 59 26.09	+ 7.099	+ 11 14 43.8	+ 39.71	21 20.0
2	0 34 45.62	7.050	2 34 52.6	45.94	21 53.5	2	2 2 16.51	7.103	11 30 33.1	39.40	21 18.9
3	0 37 34.79	7.048	2 53 14.0	45.83	21 52.4	3	2 5 7.04	7.108	11 46 15.0	39.09	21 17.8
4	0 40 23.92	7.047	3 11 32.7	45.72	21 51.3	4	2 7 57.69	7.113	12 1 49.3	38.77	21 16.7
5	0 43 13.02	7.045	3 29 48.6	45.60	21 50.1	5	2 10 48.44	7.117	12 17 15.9	38.44	21 15.6
6	0 46 2.09	+ 7.044	+ 3 48 1.4	+ 45.47	21 49.0	6	2 13 39.31	+ 7.122	+ 12 32 34.6	+ 38.11	21 14.5
7	0 48 51.13	7.043	4 6 11.0	45.33	21 47.9	7	2 16 30.28	7.126	12 47 45.2	37.77	21 13.4
8	0 51 40.15	7.042	4 24 17.2	45.18	21 46.8	8	2 19 21.37	7.131	13 2 47.6	37.43	21 12.3
9	0 54 29.15	7.042	4 42 19.9	45.03	21 45.6	9	2 22 12.57	7.136	13 17 41.8	37.08	21 11.2
10	0 57 18.14	7.041	5 0 18.7	44.87	21 44.5	10	2 25 3.89	7.140	13 32 27.5	36.73	21 10.1
11	1 0 7.13	+ 7.041	+ 5 18 13.6	+ 44.70	21 43.4	11	2 27 55.31	+ 7.145	+ 13 47 4.7	+ 36.37	21 9.0
12	1 2 56.12	7.041	5 36 4.5	44.53	21 42.2	12	2 30 46.85	7.150	14 1 33.2	36.01	21 8.0
13	1 5 45.11	7.042	5 53 51.1	44.35	21 41.1	13	2 33 38.51	7.155	14 15 53.0	35.64	21 6.9
14	1 8 34.12	7.043	6 11 33.3	44.16	21 40.0	14	2 36 30.29	7.160	14 30 3.9	35.26	21 5.8
15	1 11 23.15	7.043	6 29 10.9	43.97	21 38.9	15	2 39 22.20	7.165	14 44 5.7	34.88	21 4.7
16	1 14 12.20	+ 7.044	+ 6 46 43.8	+ 43.77	21 37.8	16	2 42 14.23	+ 7.170	+ 14 57 58.4	+ 34.50	21 3.6
17	1 17 1.28	7.046	7 4 11.9	43.56	21 36.6	17	2 45 6.38	7.175	15 11 41.8	34.11	21 2.6
18	1 19 50.41	7.048	7 21 34.8	43.35	21 35.5	18	2 47 58.66	7.181	15 25 15.8	33.72	21 1.5
19	1 22 39.59	7.050	7 38 52.6	43.13	21 34.4	19	2 50 51.06	7.186	15 38 40.4	33.32	21 0.4
20	1 25 28.82	7.052	7 56 5.1	42.91	21 33.3	20	2 53 43.59	7.192	15 51 55.4	32.92	20 59.4
21	1 28 18.11	+ 7.055	+ 8 13 12.1	+ 42.67	21 32.2	21	2 56 36.25	+ 7.197	+ 16 5 0.8	+ 32.52	20 58.3
22	1 31 7.47	7.059	8 30 13.4	42.43	21 31.0	22	2 59 29.04	7.202	16 17 56.4	32.11	20 57.2
23	1 33 56.92	7.062	8 47 9.0	42.19	21 29.9	23	3 2 21.95	7.208	16 30 42.1	31.70	20 56.2
24	1 36 46.45	7.065	9 3 58.7	41.94	21 28.8	24	3 5 14 99	7.213	16 43 17.8	31.28	20 55.1
25	1 39 36.06	7.069	9 20 42.2	41.68	21 27.7	25	3 8 8.16	7.218	16 55 43.4	30.85	20 54.1
26	1 42 25.76	+ 7.073	+ 9 37 19.5	+ 41.42	21 26.6	26	3 11 1.45	+ 7.223	+ 17 7 58.8	+ 30.42	20 53.0
27	1 45 15.56	7.077	9 53 50.4	41.15	21 25.5	27	3 13 54.86	7.228	17 20 3.9	29.99	20 52.0
28	1 48 5.46	7.081	10 10 14.8	40.87	21 24.4	28	3 16 48.38	7.232	17 31 58.6	29.56	20 50.9
29	1 50 55.46	7.085	10 26 32.5	40.59	21 23.3	29	3 19 42.01	7.237	17 43 42.8	29.12	20 49.9
30	1 53 45.56	7.090	10 42 43.3	40.30	21 22.2	30	3 22 35.74	7.241	17 55 16.4	28.68	20 48.8
31	1 56 35.77	+ 7.094	+ 10 58 47.1	+ 40.01	21 21.1	31	3 25 29.57	+ 7.245	+ 18 6 39.4	+ 28.23	20 47.8
32	1 59 26.09	+ 7.099	+ 11 14 43.8	+ 39.71	21 20.0	32	3 28 23.50	+ 7.249	+ 18 17 51.7	+ 27.78	20 46.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	2″.4	2″.4	2″.4	2″.4	2″.4	2″.4	2″.5	Semidiameter . .	2″.5	2″.5	2″.5	2″.5	2″.6	2″.6
Hor. Parallax . .	4.2	4.2	4.2	4.3	4.3	4.3	4.3	Hor. Parallax . .	4.4	4.4	4.4	4.5	4.5	4.6

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 25 29.57	+ 7.945	+ 18 6 39.4	+ 28.23	20 47.8
2	3 28 23.50	7.949	18 17 51.7	27.78	20 46.7
3	3 31 17.51	7.952	18 28 53.1	27.33	20 45.7
4	3 34 11.59	7.955	18 39 43.6	26.87	20 44.7
5	3 37 5.74	7.958	18 50 23.0	26.41	20 43.6
6	3 39 59.95	+ 7.960	+ 19 0 51.3	+ 25.95	20 42.6
7	3 42 54.22	7.962	19 11 8.5	25.48	20 41.5
8	3 45 48.55	7.964	19 21 14.5	25.01	20 40.5
9	3 48 42.92	7.966	19 31 9.2	24.54	20 39.5
10	3 51 37.32	7.968	19 40 52.5	24.07	20 38.4
11	3 54 31.76	+ 7.969	+ 19 50 24.4	+ 23.59	20 37.4
12	3 57 26.23	7.970	19 59 44.8	23.11	20 36.4
13	4 0 20.72	7.971	20 8 53.7	22.63	20 35.3
14	4 3 15.23	7.972	20 17 51.1	22.15	20 34.3
15	4 6 9.75	7.972	20 26 36.9	21.67	20 33.3
16	4 9 4.28	+ 7.972	+ 20 35 11.0	+ 21.18	20 32.3
17	4 11 58.80	7.972	20 43 33.4	20.69	20 31.2
18	4 14 53.33	7.972	20 51 44.1	20.20	20 30.2
19	4 17 47.84	7.971	20 59 43.0	19.71	20 29.2
20	4 20 42.33	7.970	21 7 30.1	19.22	20 28.1
21	4 23 36.80	+ 7.969	+ 21 15 5.4	+ 18.73	20 27.1
22	4 26 31.25	7.968	21 22 28.9	18.23	20 26.1
23	4 29 25.66	7.966	21 29 40.5	17.73	20 25.0
24	4 32 20.02	7.963	21 36 40.2	17.24	20 24.0
25	4 35 14.32	7.961	21 43 28.0	16.74	20 22.9
26	4 38 8.55	+ 7.958	+ 21 50 3.9	+ 16.25	20 21.9
27	4 41 2.70	7.954	21 56 27.8	15.75	20 20.9
28	4 43 56.75	7.950	22 2 39.8	15.25	20 19.8
29	4 46 50.71	7.946	22 8 39.9	14.76	20 18.8
30	4 49 44.55	7.941	22 14 28.1	14.26	20 17.7
31	4 52 38.26	+ 7.935	+ 22 20 4.2	+ 13.76	20 16.7
32	4 55 31.83	+ 7.929	+ 22 25 28.4	+ 13.26	20 15.6

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	2″.6	2″.7	2″.7	2″.7	2″.7	2″.8
Hor. Parallax . .	4.6	4.7	4.7	4.8	4.8	4.9

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	4 55 31.83	+ 7.229	+ 22 25 28.4	+ 13.26	20 15.6
2	4 58 25.25	7.222	22 30 40.7	12.76	20 14.6
3	5 1 18.50	7.215	22 35 41.1	12.27	20 13.5
4	5 4 11.56	7.207	22 40 29.6	11.77	20 12.5
5	5 7 4.43	7.199	22 45 6.3	11.28	20 11.4
6	5 9 57.10	+ 7.190	+ 22 49 31.0	+ 10.78	20 10.3
7	5 12 49.55	7.181	22 53 43.9	10.29	20 9.3
8	5 15 41.77	7.171	22 57 45.0	9.80	20 8.2
9	5 18 33.75	7.161	23 1 34.4	9.31	20 7.1
10	5 21 25.49	7.150	23 5 12.1	8.83	20 6.0
11	5 24 16.97	+ 7.139	+ 23 8 38.1	+ 8.34	20 4.9
12	5 27 8.18	7.128	23 11 52.5	7.86	20 3.8
13	5 29 59.12	7.116	23 14 55.3	7.37	20 2.7
14	5 32 49.77	7.104	23 17 46.5	6.89	20 1.6
15	5 35 40.12	7.092	23 20 26.2	6.42	20 0.5
16	5 38 30.17	+ 7.079	+ 23 22 54.6	+ 5.94	19 59.4
17	5 41 19.91	7.066	23 25 11.5	5.47	19 58.3
18	5 44 9.33	7.052	23 27 17.1	5.00	19 57.2
19	5 46 58.42	7.038	23 29 11.5	4.53	19 56.1
20	5 49 47.16	7.024	23 30 54.8	4.07	19 54.9
21	5 52 35.54	+ 7.009	+ 23 32 27.0	+ 3.61	19 53.8
22	5 55 23.56	6.993	23 33 48.1	3.15	19 52.6
23	5 58 11.20	6.977	23 34 58.3	2.70	19 51.5
24	6 0 58.44	6.960	23 35 57.7	2.25	19 50.3
25	6 3 45.28	6.943	23 36 46.4	1.81	19 49.1
26	6 6 31.70	+ 6.925	+ 23 37 24.4	+ 1.37	19 48.0
27	6 9 17.68	6.906	23 37 51.9	0.93	19 46.8
28	6 12 3.21	6.888	23 38 8.9	0.49	19 45.6
29	6 14 48.28	6.868	23 38 15.6	+ 0.06	19 44.4
30	6 17 32.87	6.848	23 38 12.0	− 0.36	19 43.2
31	6 20 16.97	+ 6.827	+ 23 37 58.2	− 0.78	19 42.0
32	6 23 0.55	+ 6.805	+ 23 37 34.4	− 1.20	19 40.8

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	2″.8	2″.8	2″.9	2″.9	2″.9	3″.0
Hor. Parallax . .	4.9	5.0	5.1	5.1	5.2	5.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.							OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 23 0.55	+ 6.805	+ 23 37 34.4	− 1.20	19 40.8	1	7 39 57.65	+ 5.951	+ 22 18 52.7	− 10.95	18 59.2
2	6 25 43.61	6.783	23 37 0.8	1.61	19 39.5	2	7 42 20.05	5.915	22 14 27.3	11.16	18 57.6
3	6 28 26.14	6.761	23 36 17.4	2.01	19 38.3	3	7 44 41.57	5.878	22 9 56.7	11.37	18 56.1
4	6 31 8.12	6.738	23 35 24.3	2.41	19 37.0	4	7 47 2.21	5.841	22 5 21.3	11.57	18 54.5
5	6 33 49.54	6.714	23 34 21.6	2.81	19 35.8	5	7 49 21.95	5.803	22 0 41.0	11.76	18 52.8
6	6 36 30.38	+ 6.690	+ 23 33 9.5	− 3.20	19 34.5	6	7 51 40.78	+ 5.765	+ 21 55 56.5	− 11.95	18 51.2
7	6 39 10.65	6.666	23 31 48.1	3.58	19 33.2	7	7 53 58.68	5.727	21 51 7.5	12.13	18 49.5
8	6 41 50.33	6.641	23 30 17.5	3.96	19 32.0	8	7 56 15.65	5.688	21 46 14.4	12.30	18 47.8
9	6 44 29.40	6.616	23 28 37.9	4.34	19 30.7	9	7 58 31.69	5.649	21 41 17.4	12.46	18 46.2
10	6 47 7.87	6.590	23 26 49.3	4.71	19 29.3	10	8 0 46.78	5.609	21 36 16.6	12.61	18 44.5
11	6 49 45.72	+ 6.564	+ 23 24 52.0	− 5.07	19 28.0	11	8 3 0.92	+ 5.569	+ 21 31 12.3	− 12.75	18 42.7
12	6 52 22.94	6.538	23 22 46.0	5.43	19 26.7	12	8 5 14.10	5.529	21 26 4.6	12.88	18 41.0
13	6 54 59.53	6.511	23 20 31.5	5.78	19 25.4	13	8 7 26.30	5.488	21 20 53.8	13.01	18 39.3
14	6 57 35.47	6.484	23 18 8.6	6.12	19 24.0	14	8 9 37.51	5.447	21 15 40.0	13.13	18 37.5
15	7 0 10.76	6.457	23 15 37.5	6.46	19 22.7	15	8 11 47.73	5.405	21 10 23.5	13.24	18 35.7
16	7 2 45.39	+ 6.429	+ 23 12 58.3	− 6.80	19 21.3	16	8 13 56.95	+ 5.363	+ 21 5 4.5	− 13.34	18 33.9
17	7 5 19.35	6.401	23 10 11.2	7.13	19 19.9	17	8 16 5.14	5.320	20 59 43.3	13 43	18 32.1
18	7 7 52.63	6.372	23 7 16.3	7.45	19 18.5	18	8 18 12.30	5.277	20 54 19.9	13.51	18 30.3
19	7 10 25.21	6.343	23 4 13.8	7.76	19 17.1	19	8 20 18.41	5.233	20 48 54.7	13.58	18 28.4
20	7 12 57.09	6.314	23 1 3.8	8.07	19 15.7	20	8 22 23.46	5.188	20 43 28.0	13.64	18 26.6
21	7 15 28.26	+ 6.284	+ 22 57 46.5	− 8.37	19 14.2	21	8 24 27.44	+ 5.143	+ 20 37 59.9	− 13.69	18 24 7
22	7 17 58.70	6.253	22 54 22.2	8.66	19 12.8	22	8 26 30.32	5.097	20 32 30.7	13.73	18 22.7
23	7 20 28 40	6.222	22 50 50.9	8.94	19 11.3	23	8 28 32.09	5.050	20 27 0.6	13.77	18 20.8
24	7 22 57.35	6.190	22 47 12.9	9.22	19 9.9	24	8 30 32.72	5.002	20 21 29.9	13.79	18 18.9
25	7 25 25.53	6.158	22 43 28.3	9.49	19 8.4	25	8 32 32.26	4.954	20 15 58.8	13.80	18 16.9
26	7 27 52.92	+ 6.125	+ 22 39 37.3	− 9.75	19 6.9	26	8 34 30.51	+ 4.906	+ 20 10 27.6	− 13.80	18 14.9
27	7 30 19.52	6.091	22 35 40.0	10.01	19 5.4	27	8 36 27.62	4.856	20 4 56.6	13.78	18 12.9
28	7 32 45.30	6.057	22 31 36.7	10.26	19 3.9	28	8 38 23.53	4.805	19 59 26.0	13.76	18 10.9
29	7 35 10.26	6.022	22 27 27.7	10.50	19 2.3	29	8 40 18.21	4.753	19 53 56.0	13.73	18 8.9
30	7 37 34.38	5.987	22 23 12.9	10.73	19 0.8	30	8 42 11.65	4.700	19 48 26.9	13.69	18 6.8
31	7 39 57.65	+ 5.951	+ 22 18 52.7	− 10.95	18 59.2	31	8 44 3.81	+ 4.647	+ 19 42 59.0	− 13.63	18 4.7
32	7 42 20.05	+ 5.915	+ 22 14 27.3	− 11.16	18 57.6	32	8 45 54.68	+ 4.592	+ 19 37 32.5	− 13.57	18 2.6

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	3″.1	3″.1	3″.2	3″.3	3″.3	3″.4	Semidiameter . .	3″.5	3″.6	3″.7	3″.8	3″.9	4″.0
Hor. Parallax . .	5.4	5.5	5.6	5.7	5.8	6.0	Hor. Parallax . .	6.1	6.3	6.5	6.7	6.9	7.1

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	8 45 54.68	+ 4.592	+ 19 37 32.5	− 13.57	18 2.6
2	8 47 44.25	4.538	19 32 7.7	13.50	18 0.5
3	8 49 32.49	4.482	19 26 44.8	13.41	17 58.3
4	8 51 19.39	4.425	19 21 24.0	13.31	17 56.1
5	8 53 4.93	4.368	19 16 5.6	13.21	17 53.9
6	8 54 49.10	+ 4.311	+ 19 10 49 9	− 13.09	17 51.7
7	8 56 31.87	4.253	19 5 37.2	12.96	17 49.5
8	8 58 13.23	4.194	19 0 27.6	12.83	17 47.2
9	8 59 53.15	4.133	18 55 21.4	12.68	17 44.9
10	9 1 31.62	4.072	18 50 19.0	12.52	17 42.6
11	9 3 8.62	+ 4.010	+ 18 45 20.6	− 12.34	17 40.2
12	9 4 44.11	3.948	18 40 26.4	12.16	17 37.9
13	9 6 18.12	3.884	18 35 36.8	11.97	17 35.5
14	9 7 50.57	3.819	18 30 52.0	11.76	17 33.1
15	9 9 21.45	3.752	18 26 12.3	11.54	17 30.6
16	9 10 50.75	+ 3.687	+ 18 21 37.9	− 11.31	17 28.2
17	9 12 18.42	3.619	18 17 9.3	11.07	17 25.7
18	9 13 44.44	3.549	18 12 46.8	10.81	17 23.2
19	9 15 8.78	3.478	18 8 30.6	10.54	17 20.6
20	9 16 31.40	3.406	18 4 21.0	10.25	17 18.0
21	9 17 52.27	+ 3.332	+ 18 0 18.4	− 9.95	17 15.4
22	9 19 11.35	3.257	17 56 23.2	9.64	17 12.8
23	9 20 28.60	3.180	17 52 35.7	9.32	17 10.1
24	9 21 43.99	3.102	17 48 56.1	8.98	17 7.4
25	9 22 57.48	3.022	17 45 24.8	8.63	17 4.7
26	9 24 9.04	+ 2.940	+ 17 42 2.1	− 8.26	17 1.9
27	9 25 18.61	2.857	17 38 48.4	7.88	16 59.1
28	9 26 26.17	2.772	17 35 43.9	7.49	16 56.3
29	9 27 31.68	2.686	17 32 49.0	7.08	16 53.4
30	9 28 35.09	2.598	17 30 3.9	6.67	16 50.5
31	9 29 36.38	+ 2.509	+ 17 27 29.0	− 6.24	16 47.6
32	9 30 35.50	+ 2.418	+ 17 25 4.6	− 5.79	16 44.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	4″.1	4″.3	4″.4	4″.6	4″.8	5″.0
Horizontal Parallax	7.3	7.6	7.8	8.1	8.4	8.8

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	9 29 36.38	+ 2.509	+ 17 27 29.0	− 6.24	16 47.6
2	9 30 35.50	2.418	17 25 4.6	5.79	16 44.6
3	9 31 32.42	2.325	17 22 50.9	5.34	16 41.6
4	9 32 27.10	2.231	17 20 48.2	4.88	16 38.5
5	9 33 19.50	2.135	17 18 56.9	4.40	16 35.4
6	9 34 9.59	+ 2.038	+ 17 17 17.1	− 3.91	16 32.3
7	9 34 57.34	1.940	17 15 49.2	3.41	16 29.1
8	9 35 42.70	1.840	17 14 33.5	2.89	16 25.9
9	9 36 25.64	1.738	17 13 30.2	2.37	16 22.7
10	9 37 6.11	1.634	17 12 39.6	1.84	16 19.4
11	9 37 44.07	+ 1.529	+ 17 12 1.8	− 1.30	16 16.1
12	9 38 19.48	1.422	17 11 37.3	0.74	16 12.7
13	9 38 52.30	1.313	17 11 26.4	− 0.17	16 9.3
14	9 39 22.48	1.202	17 11 29.3	+ 0.41	16 5.8
15	9 39 49.98	1.089	17 11 46.1	1.00	16 2.3
16	9 40 14.75	+ 0.974	+ 17 12 17.2	+ 1.59	15 58.7
17	9 40 36.74	0.857	17 13 2.7	2.20	15 55.1
18	9 40 55.89	0.738	17 14 3.0	2.82	15 51.4
19	9 41 12.18	0.618	17 15 18.3	3.45	15 47.8
20	9 41 25.54	0.495	17 16 48.7	4.09	15 44.0
21	9 41 35.92	+ 0.370	+ 17 18 34.4	+ 4.73	15 40.3
22	9 41 43.29	0.243	17 20 35.6	5.38	15 36.4
23	9 41 47.59	+ 0.115	17 22 52.6	6.03	15 32.5
24	9 41 48.79	− 0.015	17 25 25.2	6.68	15 28.6
25	9 41 46.85	0.147	17 28 13.5	7.34	15 24.6
26	9 41 41.72	− 0.280	+ 17 31 17.5	+ 7.99	15 20.5
27	9 41 33.39	0.414	17 34 37.3	8.65	15 16.4
28	9 41 21.83	0.550	17 38 12.7	9.30	15 12.2
29	9 41 7.00	0.686	17 42 3.6	9.94	15 8.0
30	9 40 48.89	0.823	17 46 10.0	10.58	15 3.8
31	9 40 27.48	− 0.961	+ 17 50 31.7	+ 11.22	14 59.5
32	9 40 2.77	− 1.098	+ 17 55 8.5	+ 11.84	14 55.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	5″.2	5″.4	5″.7	5″.9	6″.1	6″.4	6″.6
Hor. Parallax . .	9.1	9.5	9.9	10.3	10.8	11.2	11.6

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	5 35 57.95	− 1.362	+ 23 0 42.8	− 0.38	10 50.8
2	5 35 25.46	1.346	23 0 33.7	0.38	10 46.3
3	5 34 53.36	1.329	23 0 24.5	0.38	10 41.8
4	5 34 21.69	1.310	23 0 15.2	0.39	10 37.3
5	5 33 50.47	1.291	23 0 5.8	0.39	10 32.9
6	5 33 19.72	− 1.271	+ 22 59 56.3	− 0.39	10 28.4
7	5 32 49.46	1.250	22 59 46.9	0.39	10 24.0
8	5 32 19.72	1.228	22 59 37.5	0.39	10 19.6
9	5 31 50.52	1.205	22 59 28.2	0.38	10 15.2
10	5 31 21.89	1.181	22 59 18.9	0.38	10 10.8
11	5 30 53.85	− 1.156	+ 22 59 9.8	− 0.38	10 6.4
12	5 30 26.41	1.131	22 59 0.9	0.37	10 2.0
13	5 29 59.59	1.105	22 58 52.1	0.36	9 57.6
14	5 29 33.43	1.078	22 58 43.5	0.34	9 53.3
15	5 29 7.92	1.050	22 58 35.1	0.33	9 49.0
16	5 28 43.08	− 1.021	+ 22 58 27.0	− 0.31	9 44.6
17	5 28 18.93	0.992	22 58 19.2	0.30	9 40.3
18	5 27 55.48	0.962	22 58 11.7	0.28	9 36.0
19	5 27 32.75	0.932	22 58 4.5	0.27	9 31.7
20	5 27 10.75	0.901	22 57 57.5	0.25	9 27.4
21	5 26 49.49	− 0.870	+ 22 57 51.2	− 0.24	9 23.1
22	5 26 28.98	0.838	22 57 45.3	0.22	9 18.8
23	5 26 9.23	0.806	22 57 39.9	0.20	9 14.6
24	5 25 50.26	0.774	22 57 34.9	0.19	9 10.3
25	5 25 32.07	0.741	22 57 30.4	0.17	9 6.1
26	5 25 14.67	− 0.708	+ 22 57 26.5	− 0.15	9 1.9
27	5 24 58.08	0.674	22 57 23.2	0.13	8 57.7
28	5 24 42.30	0.640	22 57 20.4	0.11	8 53.5
29	5 24 27.34	0.606	22 57 18 2	0.08	8 49.3
30	5 24 13.21	0.571	22 57 16.6	0.06	8 45.1
31	5 23 59.91	− 0.536	+ 22 57 15.6	− 0.03	8 41.0
32	5 23 47.45	− 0.501	+ 22 57 15.3	0.00	8 36.9

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	22″.6	22″.2	21″.8	21″.2
Horizontal Parallax . .	2.1	2.1	2.1	2.0

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	5 23 47.45	− 0.501	+ 22 57 15.3	0.00	8 36.9
2	5 23 35.84	0.466	22 57 15.6	+ 0.03	8 32.8
3	5 23 25.08	0.430	22 57 16.6	0.06	8 28.7
4	5 23 15.19	0.394	22 57 18.2	0.08	8 24.6
5	5 23 6.16	0.358	22 57 20.5	0.11	8 20.5
6	5 22 58.00	− 0.322	+ 22 57 23.5	+ 0.14	8 16.4
7	5 22 50.72	0.286	22 57 27.3	0.17	8 12.4
8	5 22 44.31	0.249	22 57 31.8	0.20	8 8.4
9	5 22 38.79	0.212	22 57 37.0	0.23	8 4.4
10	5 22 34.14	0.175	22 57 43.0	0.26	8 0.4
11	5 22 30.37	− 0.138	+ 22 57 49.7	+ 0.29	7 56.4
12	5 22 27.49	0.102	22 57 57.2	0.32	7 52.4
13	5 22 25.49	0.065	22 58 5.4	0.35	7 48.4
14	5 22 24.37	− 0.029	22 58 14.3	0.39	7 44.4
15	5 22 24.13	+ 0.008	22 58 24.0	0.42	7 40.5
16	5 22 24.76	+ 0.044	+ 22 58 34.5	+ 0.45	7 36.6
17	5 22 26.27	0.081	22 58 45.7	0.48	7 32.7
18	5 22 28.65	0.117	22 58 57.6	0.51	7 28.8
19	5 22 31.88	0.153	22 59 10.2	0.54	7 24.9
20	5 22 35.99	0.189	22 59 23.6	0.57	7 21.1
21	5 22 40.95	+ 0.225	+ 22 59 37.7	+ 0.60	7 17.2
22	5 22 46.77	0.261	22 59 52.5	0.63	7 13.4
23	5 22 53.44	0.296	23 0 8.0	0.66	7 9.6
24	5 23 0.95	0.331	23 0 24.1	0.69	7 5.8
25	5 23 9.30	0.366	23 0 40.9	0.71	7 2.0
26	5 23 18.49	+ 0.401	+ 23 0 58.4	+ 0.74	6 58.2
27	5 23 28.52	0.436	23 1 16.6	0.77	6 54.4
28	5 23 39.38	0.470	23 1 35.4	0.80	6 50.7
29	5 23 51.07	0.504	23 1 54.8	0.83	6 47.0
30	5 24 3.58	0.538	23 2 14.8	0.86	6 43.3
31	5 24 16.90	+ 0.572	+ 23 2 35.4	+ 0.87	6 39.6
32	5 24 31.03	+ 0.606	+ 23 2 56.5	+ 0.89	6 35.9

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	21″.2	20″.6	19″.9	19″.3
Horizontal Parallax . .	2.0	1.9	1.9	1.8

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	5 23 51.07	+ 0.504	+ 23 1 54.8	+ 0.83	6 47.0	1	5 36 7.54	+ 1.424	+ 23 15 3.0	+ 1.13	4 57.3
2	5 24 3.58	0.538	23 2 14.8	0.85	6 43.3	2	5 36 42.02	1.449	23 15 30.0	1.12	4 53.9
3	5 24 16.90	0.572	23 2 35.4	0.87	6 39.6	3	5 37 17.09	1.473	23 15 56.8	1.11	4 50.6
4	5 24 31.03	0.606	23 2 56.5	0.89	6 35.9	4	5 37 52.73	1.497	23 16 23.3	1.10	4 47.3
5	5 24 45.97	0.639	23 3 18.2	0.91	6 32.2	5	5 38 28.94	1.521	23 16 49.6	1.09	4 44.0
6	5 25 1.71	+ 0.672	+ 23 3 40.4	+ 0.93	6 28.5	6	5 39 5.71	+ 1.544	+ 23 17 15.6	+ 1.07	4 40.7
7	5 25 18.23	0.705	23 4 3.0	0.95	6 24.8	7	5 39 43.04	1.567	23 17 41.2	1.06	4 37.4
8	5 25 35.55	0.738	23 4 26.1	0.97	6 21.2	8	5 40 20.91	1.590	23 18 6.5	1.05	4 34.1
9	5 25 53.65	0.770	23 4 49.7	0.99	6 17.6	9	5 40 59.32	1.612	23 18 31.5	1.03	4 30.8
10	5 26 12.53	0.802	23 5 13.8	1.01	6 14.0	10	5 41 38.26	1.634	23 18 56.1	1.02	4 27.5
11	5 26 32.18	+ 0.834	+ 23 5 38.3	+ 1.03	6 10.4	11	5 42 17.72	+ 1.655	+ 23 19 20.2	+ 1.00	4 24.2
12	5 26 52.59	0.866	23 6 3.2	1.04	6 6.8	12	5 42 57.69	1.676	23 19 43.9	0.98	4 20.9
13	5 27 13.75	0.897	23 6 28.4	1.06	6 3.2	13	5 43 38.16	1.697	23 20 7.1	0.96	4 17.7
14	5 27 35.65	0.928	23 6 53.9	1.08	5 59.6	14	5 44 19.13	1.717	23 20 29.8	0.94	4 14.4
15	5 27 58.29	0.958	23 7 19.8	1.09	5 56.1	15	5 45 0.59	1.737	23 20 51.9	0.92	4 11.2
16	5 28 21.65	+ 0.988	+ 23 7 46.0	+ 1.10	5 52.6	16	5 45 42.53	+ 1.757	+ 23 21 13.5	+ 0.89	4 8.0
17	5 28 45.73	1.018	23 8 12.5	1.11	5 49.0	17	5 46 24.93	1.776	23 21 34.5	0.87	4 4.8
18	5 29 10.52	1.047	23 8 39.2	1.12	5 45.5	18	5 47 7.79	1.795	23 21 54.9	0.84	4 1.5
19	5 29 36.02	1.076	23 9 6.1	1.13	5 42.0	19	5 47 51.10	1.814	23 22 14.7	0.81	3 58.3
20	5 30 2.21	1.105	23 9 33.2	1.13	5 38.5	20	5 48 34.86	1.832	23 22 33.8	0.78	3 55.1
21	5 30 29.08	+ 1.134	+ 23 10 0.5	+ 1.14	5 35.0	21	5 49 19.05	+ 1.850	+ 23 22 52.2	+ 0.75	3 51.9
22	5 30 56.63	1.162	23 10 27.9	1.14	5 31.5	22	5 50 3.67	1.868	23 23 9.9	0.72	3 48.7
23	5 31 24.85	1.190	23 10 55.4	1.14	5 28.0	23	5 50 48.71	1.885	23 23 26.9	0.69	3 45.5
24	5 31 53.72	1.217	23 11 23.0	1.15	5 24.6	24	5 51 34.17	1.902	23 23 43.2	0.66	3 42.3
25	5 32 23.25	1.244	23 11 50.6	1.15	5 21.1	25	5 52 20.04	1.919	23 23 58.7	0.63	3 39.2
26	5 32 53.42	+ 1.270	+ 23 12 18.2	+ 1.15	5 17.6	26	5 53 6.31	+ 1.936	+ 23 24 13.4	+ 0.59	3 36.0
27	5 33 24.22	1.296	23 12 45.9	1.15	5 14.2	27	5 53 52.98	1.952	23 24 27.2	0.56	3 32.9
28	5 33 55.65	1.322	23 13 13.5	1.15	5 10.8	28	5 54 40.03	1.968	23 24 40.2	0.53	3 29.7
29	5 34 27.71	1.348	23 13 41.0	1.14	5 7.4	29	5 55 27.47	1.984	23 24 52.3	0.49	3 26.6
30	5 35 0.38	1.374	23 14 8.5	1.14	5 4.0	30	5 56 15.29	2.000	23 25 3.5	0.45	3 23.4
31	5 35 33.66	+ 1.399	+ 23 14 35.8	+ 1.14	5 0.6	31	5 57 3.48	+ 2.015	+ 23 25 13.7	+ 0.41	3 20.3
32	5 36 7.54	+ 1.424	+ 23 15 3.0	+ 1.13	4 57.3	32	5 57 52.02	+ 2.030	+ 23 25 23.0	+ 0.37	3 17.2

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	19″.3	18″.7	18″.1	17″.6	Polar Semidiameter . .	17″.6	17″.1	16″.7	16″.3
Horizontal Parallax . .	1.8	1.8	1.7	1.7	Horizontal Parallax . .	1.7	1.6	1.6	1.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	MAY.						JUNE.				
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	5 57 3.48	+ 2.015	+ 23 25 13.7	+ 0.41	3 20.3	1	6 24 22.46	+ 2.348	+ 23 21 20.7	− 1.12	1 45.7
2	5 57 52.02	2.030	23 25 23.0	0.37	3 17.2	2	6 25 18.88	2.355	23 20 53.0	1.18	1 42.7
3	5 58 40.93	2.045	23 25 31.3	0.33	3 14.1	3	6 26 15.46	2.361	23 20 23.9	1.24	1 39.7
4	5 59 30.18	2.059	23 25 38.6	0.29	3 11.0	4	6 27 12.19	2.367	23 19 53.4	1.30	1 36.7
5	6 0 19.77	2.073	23 25 44.9	0.25	3 7.9	5	6 28 9.06	2.373	23 19 21.5	1.36	1 33.7
6	6 1 9.71	+ 2.087	+ 23 25 50.3	+ 0.20	3 4.8	6	6 29 6.07	+ 2.378	+ 23 18 48.2	− 1.41	1 30.7
7	6 1 59.97	2.101	23 25 54.6	0.16	3 1.7	7	6 30 3.22	2.383	23 18 13.6	1.47	1 27.7
8	6 2 50.55	2.114	23 25 57.9	0.12	2 58.6	8	6 31 0.49	2.388	23 17 37.6	1.53	1 24.7
9	6 3 41.45	2.127	23 26 0.1	0.07	2 55.5	9	6 31 57.88	2.393	23 17 0.2	1.59	1 21.7
10	6 4 32.66	2.140	23 26 1.2	+ 0.02	2 52.4	10	6 32 55.39	2.398	23 16 21.4	1.65	1 18.7
11	6 5 24.16	+ 2.152	+ 23 26 1.2	− 0.02	2 49.3	11	6 33 53.00	+ 2.402	+ 23 15 41.1	− 1.70	1 15.8
12	6 6 15.95	2.164	23 26 0.1	0.07	2 46.2	12	6 34 50.71	2.406	23 14 59.4	1.76	1 12.8
13	6 7 8.02	2.175	23 25 57.9	0.12	2 43.2	13	6 35 48.51	2.410	23 14 16.3	1.82	1 9.8
14	6 8 0.37	2.186	23 25 54.5	0.16	2 40.1	14	6 36 46.40	2.414	23 13 31.8	1.88	1 6.8
15	6 8 52.98	2.197	23 25 50.0	0.21	2 37.1	15	6 37 44.38	2.418	23 12 46.0	1.94	1 3.9
16	6 9 45.85	+ 2.208	+ 23 25 44.3	− 0.26	2 34.0	16	6 38 42.43	+ 2.421	+ 23 11 58.7	− 2.00	1 0.9
17	6 10 38.98	2.218	23 25 37.3	0.31	2 31.0	17	6 39 40.56	2.424	23 11 10.0	2.06	0 58.0
18	6 11 32.35	2.228	23 25 29.1	0.36	2 27.9	18	6 40 38.76	2.427	23 10 19.9	2.12	0 55.0
19	6 12 25.97	2.238	23 25 19.7	0.41	2 24.9	19	6 41 37.02	2.430	23 9 28.3	2.18	0 52.1
20	6 13 19.82	2.248	23 25 9.1	0.46	2 21.8	20	6 42 35.34	2.432	23 8 35.3	2.24	0 49.1
21	6 14 13.91	+ 2.258	+ 23 24 57.2	− 0.52	2 18.8	21	6 43 33.71	+ 2.434	+ 23 7 40.9	− 2.30	0 46.1
22	6 15 8.22	2.267	23 24 44.0	0.57	2 15.7	22	6 44 32.13	2.436	23 6 45.1	2.36	0 43.2
23	6 16 2.75	2.276	23 24 29.6	0.62	2 12.7	23	6 45 30.59	2.438	23 5 48.0	2.42	0 40.2
24	6 16 57.49	2.285	23 24 13.9	0.68	2 9.7	24	6 46 29.10	2.439	23 4 49.4	2.48	0 37.2
25	6 17 52.43	2.294	23 23 56.9	0.73	2 6.7	25	6 47 27.65	2.440	23 3 49.4	2.53	0 34.3
26	6 18 47.58	+ 2.302	+ 23 23 36.6	− 0.79	2 3.7	26	6 48 26.22	+ 2.441	+ 23 2 48.0	− 2.59	0 31.3
27	6 19 42.93	2.310	23 23 19.0	0.84	2 0.7	27	6 49 24.82	2.442	23 1 45.3	2.65	0 28.3
28	6 20 38.47	2.318	23 22 58.1	0.90	1 57.7	28	6 50 23.44	2.443	23 0 41.2	2.71	0 25.4
29	6 21 34.20	2.326	23 22 35.8	0.96	1 54.7	29	6 51 22.08	2.444	22 59 35.7	2.76	0 22.4
30	6 22 30.11	2.334	23 22 12.1	1.01	1 51.7	30	6 52 20.72	2.444	22 58 28.8	2.82	0 19.4
31	6 23 26.20	+ 2.341	+ 23 21 47.1	− 1.07	1 48.7	31	6 53 19.37	+ 2.444	+ 22 57 20.5	− 2.88	0 16.5
32	6 24 22.46	+ 2.348	+ 23 21 20.7	− 1.12	1 45.7	32	6 54 18.02	+ 2.444	+ 22 56 10.9	− 2.94	0 13.5

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	16″.3	16″.0	15″.7	15″.5	Polar Semidiameter . .	15″.5	15″.3	15″.2	15″.2
Horizontal Parallax . .	1.5	1.5	1.5	1.5	Horizontal Parallax . .	1.5	1.4	1.4	1.4

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 53 19.37	+ 2.444	+ 22 57 20.5	− 2.88	0 16.5	1	7 23 10.42	+ 2.337	+ 22 11 48.3	− 4.38	22 41.3
2	6 54 18.02	2.444	22 56 10.9	2.94	0 13.5	2	7 24 6.45	2.330	22 10 2.9	4.41	22 38.3
3	6 55 16.66	2.444	22 54 59.9	2.99	0 10.6	3	7 25 2.31	2.323	22 8 16.6	4.45	22 35.3
4	6 56 15.29	2.443	22 53 47.6	3.05	0 7.6	4	7 25 57.99	2.316	22 6 29.4	4.48	22 32.3
5	6 57 13.90	2.442	22 52 34.0	3.10	0 4.7	5	7 26 53.49	2.308	22 4 41.4	4.52	22 29.2
6	6 58 12.49	+ 2.441	+ 22 51 19.0	− 3.16	0 1.7 23 58.7	6	7 27 48.81	+ 2.300	+ 22 2 52.6	− 4.55	22 26.2
7	6 59 11.05	2.440	22 50 2.7	3.21	23 55.8	7	7 28 43.94	2.292	22 1 3.1	4.58	22 23.2
8	7 0 9.58	2.438	22 48 45.1	3.26	23 52.8	8	7 29 38.87	2.284	21 59 12.8	4.61	22 20.2
9	7 1 8.07	2.436	22 47 26.3	3.31	23 49.8	9	7 30 33.60	2.276	21 57 21.8	4.64	22 17.2
10	7 2 6.52	2.434	22 46 6.2	3.36	23 46.9	10	7 31 28.12	2.267	21 55 30.1	4.67	22 14.1
11	7 3 4.92	+ 2.432	+ 22 44 44.8	− 3.42	23 43.9	11	7 32 22.42	+ 2.258	+ 21 53 37.7	− 4.70	22 11.1
12	7 4 3.26	2.429	22 43 22.2	3.47	23 40.9	12	7 33 16.51	2.249	21 51 44.7	4.73	22 8.1
13	7 5 1.52	2.426	22 41 58.4	3.52	23 38.0	13	7 34 10.37	2.240	21 49 51.0	4.75	22 5.0
14	7 5 59.70	2.423	22 40 33.3	3.57	23 35.0	14	7 35 4.00	2.230	21 47 56.7	4.77	22 2.0
15	7 6 57.81	2.420	22 39 7.0	3.62	23 32.0	15	7 35 57.40	2.220	21 46 1.9	4.80	21 58.9
16	7 7 55.85	+ 2.417	+ 22 37 39.5	− 3.67	23 29.0	16	7 36 50.57	+ 2 210	+ 21 44 6.5	− 4.82	21 55.9
17	7 8 53.83	2.414	22 36 10.8	3.72	23 26.1	17	7 37 43.49	2.200	21 42 10.6	4.84	21 52 8
18	7 9 51.71	2.410	22 34 41.0	3.77	23 23.1	18	7 38 36.17	2.190	21 40 14.2	4.86	21 49.8
19	7 10 49.49	2.406	22 33 10.0	3.82	23 20.1	19	7 39 28.61	2.180	21 38 17.4	4.88	21 46.7
20	7 11 47.18	2 402	22 31 37.8	3.86	23 17.1	20	7 40 20.79	2.169	21 36 20.1	4.90	21 43.7
21	7 12 44.78	+ 2.398	+ 22 30 4.5	− 3.91	23 14.2	21	7 41 12.71	+ 2.158	+ 21 34 22.4	− 4.92	21 40.6
22	7 13 42.27	2.394	22 28 30.1	3.96	23 11.2	22	7 42 4.37	2.147	21 32 24.3	4.93	21 37.5
23	7 14 39.65	2.389	22 26 54.6	4.00	23 8.2	23	7 42 55.75	2.135	21 30 25.9	4.94	21 34.4
24	7 15 36.92	2.384	22 25 18.0	4.05	23 5.2	24	7 43 46.85	2.123	21 28 27.2	4.95	21 31.3
25	7 16 34.08	2.379	22 23 40.3	4.09	23 2.3	25	7 44 37.67	2.111	21 26 28.2	4.96	21 28.2
26	7 17 31.11	+ 2.374	+ 22 22 1.6	− 4.14	22 59.3	26	7 45 28.19	+ 2.099	+ 21 24 28.9	− 4.97	21 25.1
27	7 18 28.01	2.369	22 20 21.9	4.18	22 56.3	27	7 46 18.42	2.087	21 22 29.4	4.98	21 22.0
28	7 19 24.78	2.363	22 18 41.1	4.22	22 53.3	28	7 47 8.34	2.075	21 20 29.8	4.99	21 18.9
29	7 20 21.42	2.357	22 16 59.3	4.26	22 50.3	29	7 47 57.94	2.062	21 18 30.0	4.99	21 15.8
30	7 21 17.91	2.351	22 15 16.6	4.30	22 47.3	30	7 48 47.22	2.048	21 16 30.1	5.00	21 12.7
31	7 22 14.25	+ 2.344	+ 22 13 32.9	− 4.34	22 44.3	31	7 49 36.19	+ 2.034	+ 21 14 30.2	− 5.00	21 9.5
32	7 23 10.42	+ 2.337	+ 22 11 48.3	− 4.38	22 41.3	32	7 50 24.83	+ 2.020	+ 21 12 30.2	− 5.00	21 6.4

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	15″.2	15″.2	15″.2	15″.3
Horizontal Parallax . .	1.4	1.4	1.4	1.4

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	15″.3	15″.5	15″.7	15″.9
Horizontal Parallax . .	1.4	1.5	1.5	1.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	7 50 24.83	+ 2.020	+ 21 12 30.2	− 5.00	21 6.4
2	7 51 13.15	2.006	21 10 30.3	5.00	21 3.3
3	7 52 1.12	1.991	21 8 30.4	4.99	21 0.2
4	7 52 48.74	1.976	21 6 30.6	4.99	20 57.0
5	7 53 36.00	1.961	21 4 30.9	4.98	20 53.9
6	7 54 22.90	+ 1.946	+ 21 2 31.4	− 4.97	20 50.8
7	7 55 9.43	1.931	21 0 32.1	4.96	20 47.6
8	7 55 55.59	1.915	20 58 33.1	4.95	20 44.4
9	7 56 41.37	1.899	20 56 34.3	4.94	20 41.2
10	7 57 26.76	1.883	20 54 35.8	4.93	20 38.0
11	7 58 11.76	+ 1.867	+ 20 52 37.6	− 4.92	20 34.8
12	7 58 56.37	1.851	20 50 39.8	4.90	20 31.6
13	7 59 40.58	1.834	20 48 42.4	4.88	20 28.4
14	8 0 24.38	1.817	20 46 45.4	4.86	20 25.2
15	8 1 7.76	1.799	20 44 48.9	4.84	20 22.0
16	8 1 50.72	+ 1.781	+ 20 42 53.0	− 4.82	20 18.7
17	8 2 33.26	1.763	20 40 57.7	4.80	20 15.5
18	8 3 15.37	1.745	20 39 3.0	4.77	20 12.3
19	8 3 57.04	1.726	20 37 8.9	4.74	20 9.1
20	8 4 38.27	1.707	20 35 15.5	4.71	20 5.8
21	8 5 19.05	+ 1.688	+ 20 33 22.9	− 4.68	20 2.6
22	8 5 59.37	1.669	20 31 31.1	4.65	19 59.3
23	8 6 39.22	1.650	20 29 40.0	4.61	19 56.0
24	8 7 18.59	1.630	20 27 49.8	4.57	19 52.7
25	8 7 57.49	1.610	20 26 0.5	4.53	19 49.4
26	8 8 35.91	+ 1.590	+ 20 24 12.2	− 4.49	19 46.1
27	8 9 13.83	1.569	20 22 24.9	4.45	19 42.8
28	8 9 51.25	1.548	20 20 38.7	4.40	19 39.5
29	8 10 28.16	1.527	20 18 53.6	4.35	19 36.2
30	8 11 4.55	1.505	20 17 9.6	4.30	19 32.8
31	8 11 40.41	+ 1.483	+ 20 15 26.8	− 4.25	19 29.5
32	8 12 15.74	+ 1.461	+ 20 13 45.3	− 4.20	19 26.1

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	15.″9	16.″3	16.″6	17.″0
Horizontal Parallax . .	1.5	1.5	1.6	1.6

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	8 11 40.41	+ 1.483	+ 20 15 26.8	− 4.25	19 29.5
2	8 12 15.74	1.461	20 13 45.3	4.20	19 26.1
3	8 12 50.53	1.438	20 12 5.1	4.15	19 22.8
4	8 13 24.77	1.415	20 10 26.2	4.09	19 19.4
5	8 13 58.45	1.392	20 8 48.6	4.03	19 16.0
6	8 14 31.57	+ 1.368	+ 20 7 12.4	− 3.97	19 12 6
7	8 15 4.13	1.344	20 5 37.7	3.91	19 9.2
8	8 15 36.11	1.320	20 4 4.5	3.85	19 5.8
9	8 16 7.51	1.296	20 2 32.9	3.79	19 2.4
10	8 16 38.32	1.271	20 1 2.8	3.72	18 58.9
11	8 17 8.54	+ 1.246	+ 19 59 34.3	− 3.65	18 55.5
12	8 17 38.16	1.221	19 58 7.5	3.58	18 52.1
13	8 18 7.17	1.196	19 56 42.4	3.51	18 48.6
14	8 18 35.57	1.171	19 55 19.0	3.44	18 45.1
15	8 19 3.36	1.145	19 53 57.4	3.36	18 41.6
16	8 19 30.52	+ 1.119	+ 19 52 37.6	− 3.28	18 38.1
17	8 19 57.05	1.093	19 51 19.7	3.20	18 34.6
18	8 20 22.95	1.066	19 50 3.8	3.12	18 31.1
19	8 20 48.20	1.039	19 48 49.8	3.04	18 27.6
20	8 21 12.80	1.011	19 47 37.8	2.96	18 24.1
21	8 21 36.73	+ 0.983	+ 19 46 27.9	− 2.87	18 20.6
22	8 22 0.00	0.955	19 45 20.0	2.78	18 17.0
23	8 22 22.59	0.927	19 44 14.3	2.69	18 13.5
24	8 22 44.50	0.898	19 43 10.8	2.60	18 9.9
25	8 23 5.72	0.869	19 42 9.4	2.51	18 6.3
26	8 23 26.24	+ 0.840	+ 19 41 10.3	− 2.42	18 2.7
27	8 23 46.05	0.811	19 40 13.5	2.32	17 59.1
28	8 24 5.15	0.781	19 39 19.1	2.22	17 55.5
29	8 24 23.53	0.751	19 38 27.0	2.12	17 51.8
30	8 24 41.18	0.721	19 37 37.4	2.02	17 48.1
31	8 24 58.10	+ 0.690	+ 19 36 50.2	− 1.92	17 44.5
32	8 25 14.29	+ 0.659	+ 19 36 5.5	− 1.81	17 40.8

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	17.″0	17.″4	17.″9	18.″5
Horizontal Parallax . .	1.6	1.7	1.7	1.8

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	8 25 14.29	+ 0.659	+ 19 36 5.5	− 1.81	17 40.8	1	8 27 15.75	− 0.338	+ 19 34 49.3	+ 1.67	15 44.6
2	8 25 29.74	0.628	19 35 23.3	1.70	17 37.1	2	8 27 7.23	0.372	19 35 30.7	1.78	15 40.5
3	8 25 44.43	0.597	19 34 43.7	1.60	17 33.4	3	8 26 57.90	0.405	19 36 14.9	1.90	15 36.4
4	8 25 58.37	0.565	19 34 6.7	1.49	17 29.7	4	8 26 47.77	0.438	19 37 1.9	2.02	15 32.3
5	8 26 11.54	0.533	19 33 32.3	1.38	17 26.0	5	8 26 36.84	0.471	19 37 51.6	2.13	15 28.2
6	8 26 23.94	+ 0.501	+ 19 33 0.4	− 1.27	17 22.3	6	8 26 25.11	− 0.504	+ 19 38 44.0	+ 2.24	15 24.1
7	8 26 35.58	0.469	19 32 31.1	1.16	17 18.5	7	8 26 12.60	0.537	19 39 39.0	2.35	15 20.0
8	8 26 46.45	0.437	19 32 4.6	1.05	17 14.8	8	8 25 59.31	0.570	19 40 36.6	2.46	15 15.8
9	8 26 56.54	0.405	19 31 40.8	0.94	17 11.0	9	8 25 45.24	0.602	19 41 36.8	2.57	15 11.6
10	8 27 5.86	0.372	19 31 19.7	0.83	17 7.2	10	8 25 30.41	0.634	19 42 39.6	2.67	15 7.4
11	8 27 14.39	+ 0.339	+ 19 31 1.3	− 0.72	17 3.4	11	8 25 14.82	− 0.666	+ 19 43 44.9	+ 2.77	15 3.2
12	8 27 22.13	0.306	19 30 45.6	0.60	16 59.6	12	8 24 58.47	0.697	19 44 52.6	2.87	14 59.0
13	8 27 29.09	0.273	19 30 32.7	0.49	16 55.8	13	8 24 41.38	0.728	19 46 2.6	2.97	14 54.7
14	8 27 35.25	0.240	19 30 22.6	0.37	16 51.9	14	8 24 23.56	0.758	19 47 15.0	3.07	14 50.5
15	8 27 40.61	0.207	19 30 15.3	0.25	16 48.0	15	8 24 5.02	0.788	19 48 29.8	3.16	14 46.2
16	8 27 45.17	+ 0.174	+ 19 30 10.8	− 0.13	16 44.2	16	8 23 45.77	− 0.817	+ 19 49 46.8	+ 3.25	14 42.0
17	8 27 48.93	0.140	19 30 9.2	− 0.01	16 40.3	17	8 23 25.80	0.846	19 51 6.0	3.34	14 37.7
18	8 27 51.88	0.106	19 30 10.5	+ 0.11	16 36.4	18	8 23 5.14	0.875	19 52 27.3	3.43	14 33.5
19	8 27 54.02	0.072	19 30 14.6	0.23	16 32.5	19	8 22 43.80	0.903	19 53 50.7	3.52	14 29.2
20	8 27 55.35	0.038	19 30 21.6	0.35	16 28.6	20	8 22 21.78	0.931	19 55 16.2	3.60	14 24.9
21	8 27 55.86	+ 0.004	+ 19 30 31.5	+ 0.47	16 24.7	21	8 21 59.11	− 0.958	+ 19 56 43.7	+ 3.68	14 20.6
22	8 27 55.55	− 0.030	19 30 44.3	0.59	16 20.8	22	8 21 35.79	0.985	19 58 13.1	3.76	14 16.3
23	8 27 54.42	0.064	19 31 0.0	0.71	16 16.8	23	8 21 11.84	1.011	19 59 44.3	3.83	14 12.0
24	8 27 52.47	0.098	19 31 18.6	0.83	16 12.8	24	8 20 47.27	1.036	20 1 17.2	3.90	14 7.6
25	8 27 49.69	0.133	19 31 40.1	0.95	16 8.8	25	8 20 22.09	1.061	20 2 51.9	3.97	14 3.2
26	8 27 46.09	− 0.167	+ 19 32 4.5	+ 1.07	16 4.8	26	8 19 56.33	− 1.085	+ 20 4 28.3	+ 4.04	13 58.9
27	8 27 41.66	0.202	19 32 31.7	1.19	16 0.8	27	8 19 30.00	1.109	20 6 6.1	4.10	13 54.5
28	8 27 36.41	0.236	19 33 1.8	1.31	15 56.8	28	8 19 3.10	1.132	20 7 45.3	4.16	13 50.1
29	8 27 30.34	0.270	19 33 34.8	1.43	15 52.8	29	8 18 35.68	1.154	20 9 25.9	4.21	13 45.7
30	8 27 23.45	0.304	19 34 10.6	1.55	15 48.7	30	8 18 7.74	1.175	20 11 7.8	4.26	13 41.3
31	8 27 15.75	− 0.338	+ 19 34 49.3	+ 1.67	15 44.6	31	8 17 39.31	− 1.195	+ 20 12 50.9	+ 4.31	13 36.9
32	8 27 7.23	− 0.372	+ 19 35 30.7	+ 1.78	15 40.5	32	8 17 10.41	− 1.214	+ 20 14 35.1	+ 4.36	13 32.5

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	18″.6	19″.2	19″.8	20″.4	Polar Semidiameter . .	20″.4	20″.9	21″.4	21″.8
Horizontal Parallax . .	1.8	1.8	1.9	1.9	Horizontal Parallax . .	1.9	2.0	2.0	2.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 11 10.54	− 0.362	+ 15 26 55.4	− 0.77	8 26.5
2	3 11 2.04	0.346	15 26 37.9	0.69	8 22.5
3	3 10 53.95	0.328	15 26 22.1	0.62	8 18.4
4	3 10 46.29	0.311	15 26 8.1	0.55	8 14.3
5	3 10 39.05	0.293	15 25 56.0	0.47	8 10.3
6	3 10 32.24	− 0.275	+ 15 25 45.7	− 0.39	8 6.3
7	3 10 25.85	0.257	15 25 37.3	0.32	8 2.2
8	3 10 19.89	0.239	15 25 30.6	0.24	7 58.2
9	3 10 14.38	0.221	15 25 25.9	0.16	7 54.2
10	3 10 9.29	0.203	15 25 22.9	0.09	7 50.1
11	3 10 4.65	− 0.184	+ 15 25 21.8	− 0.01	7 46.1
12	3 10 0.45	0.166	15 25 22.6	+ 0.07	7 42.1
13	3 9 56.70	0.147	15 25 25.2	0.15	7 38.1
14	3 9 53.39	0.129	15 25 29.7	0.22	7 34.2
15	3 9 50.53	0.110	15 25 36.1	0.30	7 30.2
16	3 9 48.13	− 0.091	+ 15 25 44.3	+ 0.38	7 26.2
17	3 9 46.18	0.072	15 25 54.5	0.46	7 22.3
18	3 9 44.67	0.054	15 26 6.4	0.54	7 18.3
19	3 9 43.61	0.035	15 26 20.3	0.61	7 14.4
20	3 9 43.01	− 0.016	15 26 36.0	0.69	7 10.4
21	3 9 42.85	+ 0.003	+ 15 26 53.6	+ 0.77	7 6.5
22	3 9 43.14	0.021	15 27 13.0	0.85	7 2.6
23	3 9 43.88	0.040	15 27 34.2	0.92	6 58.6
24	3 9 45.07	0.059	15 27 57.2	1.00	6 54.7
25	3 9 46.71	0.078	15 28 22.2	1.07	6 50.8
26	3 9 48.80	+ 0.096	+ 15 28 48.9	+ 1.15	6 46.9
27	3 9 51.34	0.115	15 29 17.5	1.22	6 43.1
28	3 9 54.33	0.134	15 29 47.8	1.30	6 39.2
29	3 9 57.76	0.152	15 30 19.9	1.37	6 35.3
30	3 10 1.65	0.171	15 30 53.8	1.45	6 31.4
31	3 10 5.98	+ 0.190	+ 15 31 29.5	+ 1.52	6 27.6
32	3 10 10.76	+ 0.209	+ 15 32 6.9	+ 1.60	6 23.7

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	9.″2	9.″1	8.″9	8.″8
Horizontal Parallax . .	1.0	1.0	1.0	1.0

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 10 10.76	+ 0.209	+ 15 32 6.9	+ 1.60	6 23.7
2	3 10 15.99	0.227	15 32 46.1	1.67	6 19.9
3	3 10 21.66	0.245	15 33 27.0	1.74	6 16.0
4	3 10 27.77	0.264	15 34 9.7	1.81	6 12.2
5	3 10 34.33	0.282	15 34 54.1	1.89	6 8.4
6	3 10 41.33	+ 0.301	+ 15 35 40.2	+ 1.96	6 4.6
7	3 10 48.77	0.319	15 36 28.0	2.03	6 0.8
8	3 10 56.64	0.337	15 37 17.6	2.10	5 57.0
9	3 11 4.94	0.355	15 38 8.7	2.16	5 53.2
10	3 11 13.68	0.373	15 39 1.4	2.23	5 49.4
11	3 11 22.85	+ 0.391	+ 15 39 55.7	+ 2.30	5 45.6
12	3 11 32.44	0.409	15 40 51.8	2.36	5 41.8
13	3 11 42.46	0.426	15 41 49.3	2.43	5 38.1
14	3 11 52.89	0.443	15 42 48.5	2.49	5 34.3
15	3 12 3.73	0.461	15 43 49.1	2.56	5 30.6
16	3 12 15.00	+ 0.478	+ 15 44 51.3	+ 2.62	5 26.8
17	3 12 26.67	0.495	15 45 54.9	2.68	5 23.1
18	3 12 38.75	0.512	15 47 0.1	2.74	5 19.4
19	3 12 51.23	0.529	15 48 6.6	2.80	5 15.7
20	3 13 4.12	0.545	15 49 14.5	2.86	5 11.9
21	3 13 17.40	+ 0.561	+ 15 50 23.9	+ 2.92	5 8.2
22	3 13 31.07	0.578	15 51 34.7	2.97	5 4.5
23	3 13 45.13	0.594	15 52 46.8	3.03	5 0.8
24	3 13 59.57	0.610	15 54 0.3	3.09	4 57.1
25	3 14 14.40	0.626	15 55 15.1	3.14	4 53.4
26	3 14 29.59	+ 0.641	+ 15 56 31.3	+ 3.20	4 49.8
27	3 14 45.17	0.657	15 57 48.6	3.25	4 46.1
28	3 15 1.13	0.672	15 59 7.3	3.30	4 42.4
29	3 15 17.45	0.688	16 0 27.1	3.35	4 38.8
30	3 15 34.14	0.704	16 1 48.1	3.40	4 35.1
31	3 15 51.19	+ 0.718	+ 16 3 10.3	+ 3.45	4 31.4
32	3 16 8.61	+ 0.733	+ 16 4 33.8	+ 3.50	4 27.8

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8.″7	8.″6	8.″4	8.″3
Horizontal Parallax . .	1.0	1.0	1.0	0.9

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	3 15 17.45	+ 0.688	+ 16 0 27.1	+ 3.35	4 38.8	1	3 26 24.65	+ 1.077	+ 16 49 38.5	+ 4.41	2 48.0
2	3 15 34.14	0.704	16 1 48.1	3.40	4 35.1	2	3 26 50.61	1.086	16 51 24.6	4.43	2 44.5
3	3 15 51.19	0.718	16 3 10.3	3.45	4 31.4	3	3 27 16.78	1.096	16 53 11.2	4.45	2 41.0
4	3 16 8.61	0.733	16 4 33.8	3.50	4 27.8	4	3 27 43.19	1.105	16 54 58.2	4.46	2 37.5
5	3 16 26.38	0.748	16 5 58.3	3.55	4 24.2	5	3 28 9.82	1.114	16 56 45.5	4.48	2 34.0
6	3 16 44.50	+ 0.762	+ 16 7 24.0	+ 3.59	4 20.5	6	3 28 36.67	+ 1.123	+ 16 58 33.2	+ 4.49	2 30.5
7	3 17 2.97	0.777	16 8 50.7	3.63	4 16.9	7	3 29 3.72	1.132	17 0 21.2	4.51	2 27.0
8	3 17 21.78	0.791	16 10 18.6	3.68	4 13.3	8	3 29 30.99	1.141	17 2 9.6	4.52	2 23.5
9	3 17 40.93	0.805	16 11 47.4	3.72	4 9.7	9	3 29 58.46	1.149	17 3 58.2	4.53	2 20.1
10	3 18 0.42	0.819	16 13 17.3	3.76	4 6.1	10	3 30 26.13	1.157	17 5 47.0	4.54	2 16.6
11	3 18 20.24	+ 0.832	+ 16 14 48.1	+ 3.80	4 2.5	11	3 30 54.00	+ 1.165	+ 17 7 36.1	+ 4.55	2 13.1
12	3 18 40.38	0.846	16 16 19.9	3.84	3 58.9	12	3 31 22.05	1.172	17 9 25.4	4.56	2 9.6
13	3 19 0.85	0.859	16 17 52.6	3.88	3 55.3	13	3 31 50.27	1.180	17 11 14.9	4.56	2 6.2
14	3 19 21.63	0.872	16 19 26.3	3.92	3 51.7	14	3 32 18.68	1.187	17 13 4.5	4.57	2 2.7
15	3 19 42.72	0.885	16 21 0.8	3.96	3 48.1	15	3 32 47.26	1.194	17 14 54.3	4.58	1 59.3
16	3 20 4.12	+ 0.898	+ 16 22 36.3	+ 3.99	3 44.6	16	3 33 16.01	+ 1.201	+ 17 16 44.2	+ 4.58	1 55.8
17	3 20 25.83	0.911	16 24 12.5	4.02	3 41.0	17	3 33 44.92	1.208	17 18 34.2	4.59	1 52.4
18	3 20 47.82	0.923	16 25 49.5	4.06	3 37.4	18	3 34 13.99	1.215	17 20 24.3	4.59	1 48.9
19	3 21 10.12	0.935	16 27 27.3	4.09	3 33.9	19	3 34 43.21	1.221	17 22 14.4	4.59	1 45.5
20	3 21 32.71	0.947	16 29 5.9	4.12	3 30.3	20	3 35 12.59	1.227	17 24 4.6	4.59	1 42.0
21	3 21 55.57	+ 0.959	+ 16 30 45.2	+ 4.15	3 26.7	21	3 35 42.12	+ 1.233	+ 17 25 54.7	+ 4.59	1 38.6
22	3 22 18.71	0.970	16 32 25.1	4.18	3 23.2	22	3 36 11.79	1.239	17 27 44.9	4.59	1 35.1
23	3 22 42.13	0.982	16 34 5.8	4.21	3 19.6	23	3 36 41.59	1.245	17 29 35.0	4.59	1 31.7
24	3 23 5.82	0.993	16 35 47.1	4.23	3 16.1	24	3 37 11.53	1.250	17 31 25.1	4.59	1 28.3
25	3 23 29.78	1.004	16 37 29.1	4.26	3 12.6	25	3 37 41.60	1.256	17 33 15.2	4.59	1 24.8
26	3 23 54.01	+ 1.015	+ 16 39 11.6	+ 4.28	3 9.0	26	3 38 11.80	+ 1.261	+ 17 35 5.2	+ 4.58	1 21.4
27	3 24 18.49	1.025	16 40 54.7	4.31	3 5.5	27	3 38 42.11	1.266	17 36 55.0	4.57	1 18.0
28	3 24 43.22	1.036	16 42 38.5	4.33	3 2.0	28	3 39 12.55	1.271	17 38 44.7	4.57	1 14.5
29	3 25 8.21	1.046	16 44 22.7	4.35	2 58.5	29	3 39 43.10	1.275	17 40 34.3	4.56	1 11.1
30	3 25 33.44	1.057	16 46 7.5	4.38	2 55.0	30	3 40 13.76	1.280	17 42 23.7	4.56	1 7.7
31	3 25 58.93	+ 1.067	+ 16 47 52.8	+ 4.40	2 51.5	31	3 40 44.53	+ 1.284	+ 17 44 13.0	+ 4.55	1 4.3
32	3 26 24.65	+ 1.077	+ 16 49 38.5	+ 4.41	2 48.0	32	3 41 15.40	+ 1.288	+ 17 46 2.1	+ 4.54	1 0.9

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8″.3	8″.2	8″.1	8″.0	Polar Semidiameter . .	8″.0	7″.9	7″.8	7″.8
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax . .	0.9	0.9	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 40 44.53	+ 1.284	+ 17 44 13.0	+ 4.55	1 4.3
2	3 41 15.40	1.288	17 46 2.1	4.54	1 0.9
3	3 41 46.35	1.292	17 47 50.9	4.53	0 57.4
4	3 42 17.41	1.296	17 49 39.5	4.52	0 54.0
5	3 42 48.55	1.299	17 51 27.9	4.51	0 50.6
6	3 43 19.78	+ 1 303	+ 17 53 16.0	+ 4.50	0 47.2
7	3 43 51.08	1.306	17 55 3.8	4.49	0 43.8
8	3 44 22.46	1.309	17 56 51.3	4.47	0 40.4
9	3 44 53.89	1.311	17 58 38.5	4.46	0 37.0
10	3 45 25.40	1.314	18 0 25.4	4.45	0 33.6
11	3 45 56.97	+ 1.316	+ 18 2 11.9	+ 4.43	0 30.1
12	3 46 28.59	1.319	18 3 58.0	4.41	0 26.7
13	3 47 0.25	1.321	18 5 43.7	4.40	0 23.3
14	3 47 31.97	1.322	18 7 29.1	4.38	0 19.9
15	3 48 3.71	1.324	18 9 14.0	4.36	0 16.5
16	3 48 35.50	+ 1.325	+ 18 10 58.5	+ 4.35	0 13.1
17	3 49 7.31	1.326	18 12 42.6	4.33	0 9.7
18	3 49 39.15	1.327	18 14 26.2	4.31	0 6.3
19	3 50 11.01	1.328	18 16 9.3	4.29	0 2.9 23 50.5
20	3 50 42.90	1.329	18 17 51.9	4.26	23 56.1
21	3 51 14.80	+ 1.329	+ 18 19 34.0	+ 4.24	23 52.7
22	3 51 46.71	1 330	18 21 15 6	4.22	23 49.3
23	3 52 18.63	1.330	18 22 56.7	4.20	23 45.9
24	3 52 50.56	1.330	18 24 37.2	4.17	23 42.5
25	3 53 22.47	1.330	18 26 17.0	4.15	23 39.1
26	3 53 54.39	+ 1.330	+ 18 27 56.4	+ 4.13	23 35.7
27	3 54 26.29	1.329	18 29 35.2	4.10	23 32.3
28	3 54 58.18	1.329	18 31 13.4	4.08	23 28.9
29	3 55 30.05	1.328	18 32 51.1	4.06	23 25.4
30	3 56 1.91	1.327	18 34 28.1	4.03	23 22.0
31	3 56 33.74	+ 1.326	+ 18 36 4.5	+ 4.00	23 18.6
32	3 57 5.54	+ 1.324	+ 18 37 40.2	+ 3.97	23 15.2

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	7″.8	7″.7	7″.7	7″.7
Horizontal Parallax . .	0.9	0.9	0.9	0.9

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 57 5.54	+ 1.324	+ 18 37 40.2	+ 3.97	23 15.2
2	3 57 37.30	1.322	18 39 15.3	3.95	23 11.8
3	3 58 9.02	1.321	18 40 49.7	3.92	23 8.4
4	3 58 40.69	1.319	18 42 23.3	3.89	23 5.0
5	3 59 12.32	1.317	18 43 56.3	3.86	23 1.6
6	3 59 43.89	+ 1.314	+ 18 45 28.7	+ 3.84	22 58.2
7	4 0 15.40	1.312	18 47 0.4	3.80	22 54.8
8	4 0 46.84	1.309	18 48 31.3	3.77	22 51.4
9	4 1 18.22	1.306	18 50 1.5	3.74	22 48.0
10	4 1 49.52	1.302	18 51 30.9	3.71	22 44.6
11	4 2 20.74	+ 1.299	+ 18 52 59.6	+ 3.68	22 41.2
12	4 2 51.88	1.296	18 54 27.6	3.65	22 37.7
13	4 3 22.93	1.292	18 55 54.8	3 62	22 34.3
14	4 3 53.88	1.288	18 57 21.1	3.58	22 30.9
15	4 4 24.74	1.284	18 58 46.7	3.55	22 27.5
16	4 4 55.51	+ 1.280	+ 19 0 11.5	+ 3.52	22 24.1
17	4 5 26.17	1.275	19 1 35.5	3.48	22 20.7
18	4 5 56.71	1.270	19 2 58.7	3.45	22 17.2
19	4 6 27.14	1.266	19 4 21.1	3.41	22 13.8
20	4 6 57.46	1.261	19 5 42.6	3.38	22 10.4
21	4 7 27.66	+ 1.256	+ 19 7 3.3	+ 3.34	22 6.9
22	4 7 57.72	1.250	19 8 23.1	3.31	22 3.5
23	4 8 27.67	1.245	19 9 42.1	3.27	22 0.1
24	4 8 57.48	1.239	19 11 0.3	3.24	21 56.6
25	4 9 27.16	1.234	19 12 17.6	3.20	21 53.2
26	4 9 56.68	+ 1.228	+ 19 13 34.1	+ 3.17	21 49.7
27	4 10 26.07	1.221	19 14 49.6	3.13	21 46.3
28	4 10 55.30	1.215	19 16 4.4	3.10	21 42.8
29	4 11 24.38	1.208	19 17 18.2	3.06	21 39.4
30	4 11 53.30	1.201	19 18 31.2	3.02	21 35.9
31	4 12 22.05	+ 1.195	+ 19 19 43.2	+ 2.99	21 32.5
32	4 12 50.64	+ 1.187	+ 19 20 54.4	+ 2.95	21 29.0

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	7″.7	7″.8	7″.8	7″.9
Horizontal Parallax . .	0.9	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	4 12 22.05	+ 1.195	+ 19 19 43.2	+ 2.99	21 32.5	1	4 25 25.67	+ 0.882	+ 19 49 8.7	+ 1.75	19 43.5
2	4 12 50.64	1.187	19 20 54.4	2.95	21 29.0	2	4 25 46.69	0.869	19 49 50.1	1.70	19 39.9
3	4 13 19.05	1.180	19 22 4.6	2.91	21 25.5	3	4 26 7.40	0.856	19 50 30.5	1.66	19 36.3
4	4 13 47.28	1.172	19 23 13.9	2.87	21 22.1	4	4 26 27.78	0.842	19 51 9.9	1.62	19 32.7
5	4 14 15.32	1.164	19 24 22.3	2.83	21 18.6	5	4 26 47.84	0.829	19 51 48.3	1.58	19 29.1
6	4 14 43.16	+ 1.156	+ 19 25 29.7	+ 2.79	21 15.1	6	4 27 7.56	+ 0.815	+ 19 52 25.7	+ 1.54	19 25.4
7	4 15 10.81	1.148	19 26 36.3	2.75	21 11.6	7	4 27 26.94	0.801	19 53 2.1	1.50	19 21.8
8	4 15 38.25	1.140	19 27 41.9	2.71	21 8.2	8	4 27 45.99	0.786	19 53 37.5	1.46	19 18.2
9	4 16 5.50	1.131	19 28 46.6	2.67	21 4.7	9	4 28 4.69	0.772	19 54 12.0	1.42	19 14.6
10	4 16 32.54	1.122	19 29 50.3	2.64	21 1.2	10	4 28 23.05	0.758	19 54 45.5	1.37	19 11.0
11	4 16 59.36	+ 1.113	+ 19 30 53.0	+ 2.60	20 57.7	11	4 28 41.06	+ 0.743	+ 19 55 18.0	+ 1.33	19 7.3
12	4 17 25.97	1.104	19 31 54.8	2.56	20 54.2	12	4 28 58.71	0.728	19 55 49.4	1.29	19 3.7
13	4 17 52.35	1.095	19 32 55.7	2.52	20 50.7	13	4 29 16.00	0.713	19 56 19.8	1.25	19 0.0
14	4 18 18.50	1.085	19 33 55.7	2.48	20 47.2	14	4 29 32.93	0.698	19 56 49.3	1.21	18 56.4
15	4 18 44.42	1.075	19 34 54.7	2.44	20 43.7	15	4 29 49.50	0.683	19 57 17.8	1.17	18 52.7
16	4 19 10.11	+ 1.065	+ 19 35 52.7	+ 2.40	20 40.2	16	4 30 5.70	+ 0.667	+ 19 57 45.3	+ 1.12	18 49.1
17	4 19 35.56	1.055	19 36 49.8	2.36	20 36.7	17	4 30 21.51	0.651	19 58 11.8	1.08	18 45.4
18	4 20 0.75	1.045	19 37 45.9	2.32	20 33.1	18	4 30 36.96	0.636	19 58 37.3	1.04	18 41.7
19	4 20 25.71	1.035	19 38 41.1	2.28	20 29.6	19	4 30 52.03	0.620	19 59 1.9	1.00	18 38.0
20	4 20 50.42	1.024	19 39 35.3	2.24	20 26.1	20	4 31 6.72	0.604	19 59 25.5	0.96	18 34.3
21	4 21 14.87	+ 1.014	+ 19 40 28.5	+ 2.20	20 22.6	21	4 31 21.02	+ 0.588	+ 19 59 47.9	+ 0.92	18 30.6
22	4 21 39.06	1.003	19 41 20.7	2.16	20 19.1	22	4 31 34.93	0.571	20 0 9.4	0.88	18 26.9
23	4 22 2.99	0.991	19 42 12.0	2.12	20 15.5	23	4 31 48.44	0.555	20 0 30.0	0.84	18 23.2
24	4 22 26.65	0.980	19 43 2.3	2.07	20 12.0	24	4 32 1.55	0.538	20 0 49.6	0.80	18 19.5
25	4 22 50.03	0.969	19 43 51.6	2.03	20 8.4	25	4 32 14.25	0.521	20 1 8.3	0.76	18 15.7
26	4 23 13.13	+ 0.957	+ 19 44 39.8	+ 1.99	20 4.9	26	4 32 26.55	+ 0.504	+ 20 1 26.0	+ 0.72	18 12.0
27	4 23 35.96	0.945	19 45 27.1	1.95	20 1.3	27	4 32 38.44	0.487	20 1 42.6	0.67	18 8.2
28	4 23 58.50	0.933	19 46 13.4	1.91	19 57.8	28	4 32 49.91	0.469	20 1 58.3	0.63	18 4.5
29	4 24 20.74	0.921	19 46 58.7	1.87	19 54.2	29	4 33 0.97	0.452	20 2 13.0	0.59	18 0.7
30	4 24 42.69	0.908	19 47 43.0	1.83	19 50.6	30	4 33 11.61	0.434	20 2 26.8	0.55	17 57.0
31	4 25 4.33	+ 0.895	+ 19 48 26.4	+ 1.79	19 47.1	31	4 33 21.82	+ 0.416	+ 20 2 39.5	+ 0.51	17 53.2
32	4 25 25.67	+ 0.882	+ 19 49 8.7	+ 1.75	19 43.5	32	4 33 31.60	+ 0.399	+ 20 2 51.3	+ 0.47	17 49.4

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	7″.9	8″.0	8″.1	8″.2	Polar Semidiameter . .	8″.2	8″.3	8″.5	8″.6
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax . .	0.9	0.9	1.0	1.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

Day of Month.	SEPTEMBER.					Day of Month.	OCTOBER.				
	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	4 33 31.60	+ 0.399	+ 20 2 51.3	+ 0.47	17 49.4	1	4 34 56.50	− 0.169	+ 20 1 27.8	− 0.68	15 52.8
2	4 33 40.95	0.380	20 3 2.2	0.43	17 45.7	2	4 34 52.23	0.188	20 1 11.0	0.71	15 48.8
3	4 33 49.87	0.362	20 3 12.1	0.39	17 41.9	3	4 34 47.49	0.207	20 0 53.4	0.75	15 44.7
4	4 33 58.35	0.344	20 3 20.9	0.35	17 38.1	4	4 34 42.31	0.226	20 0 35.0	0.79	15 40.7
5	4 34 6.39	0.326	20 3 28.8	0.31	17 34.3	5	4 34 36.66	0.245	20 0 15.7	0.82	15 36.7
6	4 34 13.99	+ 0.307	+ 20 3 35.8	+ 0.27	17 30.5	6	4 34 30.58	− 0.263	+ 19 59 55.6	− 0.85	15 32.6
7	4 34 21.14	0.289	20 3 41.8	0.23	17 26.7	7	4 34 24.04	0.282	19 59 34.7	0.89	15 28.6
8	4 34 27.84	0.270	20 3 46.9	0.19	17 22.9	8	4 34 17.07	0.300	19 59 12.9	0.92	15 24.5
9	4 34 34.10	0.251	20 3 51.0	0.15	17 19.0	9	4 34 9.65	0.318	19 58 50.4	0.96	15 20.5
10	4 34 39.92	0.233	20 3 54.1	0.11	17 15.2	10	4 34 1.81	0.336	19 58 27.0	0.99	15 16.4
11	4 34 45.28	+ 0.214	+ 20 3 56.3	+ 0.07	17 11.3	11	4 33 53.53	− 0.354	+ 19 58 2.8	− 1.02	15 12.3
12	4 34 50.20	0.195	20 3 57.6	+ 0.04	17 7.5	12	4 33 44.83	0.372	19 57 37.8	1.06	15 8.3
13	4 34 54.66	0.176	20 3 58.0	0.00	17 3.6	13	4 33 35.70	0.389	19 57 12.1	1.09	15 4.2
14	4 34 58.67	0.157	20 3 57.3	− 0.04	16 59.8	14	4 33 26.16	0.407	19 56 45.6	1.12	15 0.1
15	4 35 2.22	0.138	20 3 55.8	0.08	16 55.9	15	4 33 16.20	0.424	19 56 18.4	1.15	14 56.0
16	4 35 5.32	+ 0.119	+ 20 3 53.3	− 0.12	16 52.0	16	4 33 5.84	− 0.441	+ 19 55 50.4	− 1.18	14 51.9
17	4 35 7.96	0.100	20 3 49.9	0.16	16 48.1	17	4 32 55.06	0.457	19 55 21.8	1.21	14 47.8
18	4 35 10.14	0.081	20 3 45.6	0.20	16 44.2	18	4 32 43.90	0.474	19 54 52.4	1.24	14 43.6
19	4 35 11.86	0.062	20 3 40.4	0.24	16 40.3	19	4 32 32.33	0.490	19 54 22.3	1.27	14 39.5
20	4 35 13.13	0.043	20 3 34.2	0.27	16 36.4	20	4 32 20.37	0.507	19 53 51.4	1.30	14 35.4
21	4 35 13.93	+ 0.024	+ 20 3 27.2	− 0.31	16 32.4	21	4 32 8.02	− 0.522	+ 19 53 19.8	− 1.33	14 31.2
22	4 35 14.27	+ 0.005	20 3 19.2	0.35	16 28.5	22	4 31 55.30	0.538	19 52 47.6	1.36	14 27.1
23	4 35 14.15	− 0.015	20 3 10.4	0.39	16 24.6	23	4 31 42.20	0.554	19 52 14.7	1.39	14 23.0
24	4 35 13.57	0.034	20 3 0.6	0.42	16 20.6	24	4 31 28.74	0.569	19 51 41.2	1.41	14 18.8
25	4 35 12.52	0.054	20 2 50.0	0.46	16 16.7	25	4 31 14.91	0.584	19 51 7.0	1.44	14 14.6
26	4 35 11.01	− 0.073	+ 20 2 38.5	− 0.50	16 12.7	26	4 31 0.73	− 0.599	+ 19 50 32.1	− 1.47	14 10.5
27	4 35 9.03	0.092	20 2 26.1	0.53	16 8.7	27	4 30 46.19	0.613	19 49 56.6	1.49	14 6.3
28	4 35 6.59	0.111	20 2 12.9	0.57	16 4.8	28	4 30 31.32	0.627	19 49 20.6	1.51	14 2.1
29	4 35 3.69	0.131	20 1 58.8	0.61	16 0.8	29	4 30 16.11	0.641	19 48 43.9	1.54	13 57.9
30	4 35 0.33	0.150	20 1 43.7	0.64	15 56.8	30	4 30 0.58	0.654	19 48 6.7	1.56	13 53.7
31	4 34 56.50	− 0.169	+ 20 1 27.8	− 0.68	15 52.8	31	4 29 44.72	− 0.667	+ 19 47 28.9	− 1.59	13 49.5
32	4 34 52.23	− 0.188	+ 20 1 11.0	− 0.71	15 48.8	32	4 29 28.57	− 0.680	+ 19 46 50.6	− 1.61	13 45.3

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8″.6	8″.8	9″.0	9″.1	Polar Semidiameter . .	9″.1	9″.3	9″.4	9″.5
Horizontal Parallax . .	1.0	1.0	1.0	1.0	Horizontal Parallax . .	1.0	1.0	1.1	1.1

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

	NOVEMBER.						DECEMBER.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	4 29 28.57	− 0.680	+ 19 46 50.6	− 1.61	13 45.3	1	4 19 50.39	− 0.859	+ 19 25 10.8	− 1.86	11 37.7
2	4 29 12.12	0.692	19 46 11.8	1.63	13 41.1	2	4 19 29.79	0.858	19 24 26.3	1.85	11 33.5
3	4 28 55.38	0.704	19 45 32.5	1.65	13 36.9	3	4 19 9.23	0.856	19 23 42.2	1.84	11 20.2
4	4 28 38.36	0.715	19 44 52.6	1.67	13 32.7	4	4 18 48.72	0 854	19 22 58.2	1.83	11 24.9
5	4 28 21.07	0.726	19 44 12.2	1.69	13 28.5	5	4 18 28.28	0.850	19 22 14.6	1.81	11 20.7
6	4 28 3.51	− 0.737	+ 19 43 31.4	− 1.71	13 24.2	6	4 18 7.91	− 0.847	+ 19 21 31.2	− 1.80	11 16.4
7	4 27 45.71	0.747	19 42 50.2	1.72	13 20 0	7	4 17 47.64	0.843	19 20 48.2	1.79	11 12.1
8	4 27 27.66	0.757	19 42 8.6	1.74	13 15.8	8	4 17 27.46	0.839	19 20 5.6	1.77	11 7.8
9	4 27 9.39	0.766	19 41 26.6	1.76	13 11.5	9	4 17 7.40	0.834	19 19 23.3	1.75	11 3.6
10	4 26 50.90	0.775	19 40 44.3	1.77	13 7.3	10	4 16 47.46	0.828	19 18 41.4	1.74	10 59.3
11	4 26 32.20	− 0.784	+ 19 40 1.6	− 1.79	13 3.1	11	4 16 27.67	− 0.822	+ 19 18 0.1	− 1.71	10 55.1
12	4 26 13.30	0.792	19 39 18.6	1.80	12 58.8	12	4 16 8.01	0.816	19 17 19.2	1.69	10 50.8
13	4 25 54.21	0.799	19 38 35.4	1.81	12 54.6	13	4 15 48.51	0.809	19 16 38.9	1.67	10 46.6
14	4 25 34.95	0 807	19 37 51.8	1.82	12 50.3	14	4 15 29.17	0.802	19 15 59.0	1.65	10 42.3
15	4 25 15.51	0.814	19 37 7.9	1.83	12 46.1	15	4 15 10.01	0.795	19 15 19.8	1 63	10 38.1
16	4 24 55.90	− 0.820	+ 19 36 23.8	− 1.84	12 41.8	16	4 14 51.03	− 0.787	+ 19 14 41.0	− 1.60	10 33.8
17	4 24 36.15	0.826	19 35 39.4	1.85	12 37.5	17	4 14 32.27	0.778	19 14 2.9	1.57	10 29.6
18	4 24 16.26	0.831	19 34 55.0	1.86	12 33.3	18	4 14 13.70	0.769	19 13 25.6	1.55	10 25.3
19	4 23 56.25	0.836	19 34 10.3	1.86	12 29.0	19	4 13 55.34	0.760	19 12 48.8	1.52	10 21.1
20	4 23 36.13	0.841	19 33 25.5	1.87	12 24.8	20	4 13 37.22	0.750	19 12 12.7	1.49	10 16.9
21	4 23 15.90	− 0.845	+ 19 32 40.5	− 1.87	12 20.5	21	4 13 19.33	− 0.740	+ 19 11 37.5	− 1.46	10 12.6
22	4 22 55.58	0.849	19 31 55.6	1.88	12 16.2	22	4 13 1.70	0.730	19 11 2.9	1.43	10 8.4
23	4 22 35.18	0.852	19 31 10.5	1.88	12 11.9	23	4 12 44.31	0.719	19 10 20.1	1.40	10 4.2
24	4 22 14.70	0.855	19 30 25.4	1.88	12 7.7	24	4 12 27.19	0.708	19 9 56.0	1.36	10 0.0
25	4 21 54.16	0.857	19 29 40.3	1.88	12 3.4	25	4 12 10.35	0.696	19 9 23.8	1.32	9 55.8
26	4 21 33.57	− 0.859	+ 19 28 55.1	− 1.88	11 59.1	26	4 11 53.79	− 0.684	+ 19 8 52.6	− 1.29	9 51.6
27	4 21 12.95	0.860	19 28 10.0	1.88	11 54.8	27	4 11 37.54	0.671	19 8 22.3	1.25	9 47.4
28	4 20 52.30	0.860	19 27 25.0	1.87	11 50.6	28	4 11 21.60	0.658	19 7 52.8	1.21	9 43.2
29	4 20 31.66	0.860	19 26 40.2	1.87	11 46.3	29	4 11 5.96	0.645	19 7 24.3	1.17	9 39.0
30	4 20 11.02	0.860	19 25 55.4	1.86	11 42.0	30	4 10 50.66	0.631	19 6 56.8	1.13	9 34.8
31	4 19 50.39	− 0.859	+ 19 25 10.8	− 1.86	11 37.7	31	4 10 35.68	− 0.617	+ 19 6 30.1	− 1.09	9 30.6
32	4 19 29.79	− 0.858	+ 19 24 26.3	− 1.85	11 33.5	32	4 10 21.06	− 0.602	+ 19 6 4.4	− 1.05	9 26.5

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	9″.5	9″.6	9″.7	9″.7	Polar Semidiameter . .	9″.7	9″.6	9″.6	9″.5
Horizontal Parallax . .	1.1	1.1	1.1	1.1	Horizontal Parallax . .	1.1	1.1	1.1	1.1

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 3	11 36 47.85	−1.107	+ 3 21 43.0	+ 9.86	16 43.0	July 2	11 23 36.29	+6.756	+ 4 44 20.4	−45.74	4 42.1
7	11 36 41.77	1.930	3 22 33.0	15.11	16 27.1	6	11 24 4.68	7.436	4 41 8.8	50.01	4 26.9
11	11 36 32.43	2.736	3 23 43.7	20.24	16 11.2	10	11 24 35.74	8.086	4 37 40.5	54.10	4 11.7
15	11 36 19.91	3.517	3 25 14.6	25.18	15 55.3	14	11 25 9.34	8.706	4 33 56.2	58.00	3 56.5
19	11 36 4.33	4.267	3 27 4.8	29.91	15 39.3	18	11 25 45.35	9.295	4 29 56.7	61.71	3 41.4
23	11 35 45.82	−4.984	+ 3 29 13.6	+34.42	15 23.3	22	11 26 23.66	+9.855	+ 4 25 42.8	−65.22	3 26.3
27	11 35 24.50	5.669	3 31 40.0	38.70	15 7.2	26	11 27 4.15	10.385	4 21 15.2	68.55	3 11.2
31	11 35 0.52	6.316	3 34 22.9	42.72	14 51.0	30	11 27 46.71	10.886	4 16 34.7	71.68	2 56.2
Feb. 4	11 34 34.03	6.919	3 37 21.3	46.44	14 34.9	Aug. 3	11 28 31.20	11.354	4 11 42.0	74.59	2 41.2
8	11 34 5.23	7.471	3 40 33.9	49.79	14 18.7	7	11 29 17.48	11.782	4 6 38.2	77.25	2 26.2
12	11 33 34.34	−7.964	+ 3 43 59.1	+52.76	14 2.4	11	11 30 5.41	12.171	+ 4 1 24.3	−79.66	2 11.3
16	11 33 1.60	8.397	3 47 35.4	55.32	13 46.1	15	11 30 54.81	12.521	3 56 1.2	81.82	1 56.4
20	11 32 27.25	8.769	3 51 21.2	57.49	13 29.8	19	11 31 45.53	12.835	3 50 30.0	83.76	1 41.5
24	11 31 51.53	9 079	3 55 14.9	59.26	13 13.5	23	11 32 37.43	13.111	3 44 51.5	85.46	1 26.6
28	11 31 14.70	9.326	3 59 14.6	60.61	12 57.2	27	11 33 30.37	13.352	3 39 6.6	86.91	1 11.8
Mar. 4	11 30 37.01	−9.509	+ 4 3 19.2	+61.52	12 40.8	31	11 34 24.20	13.553	+ 3 33 16.4	−88.09	0 57.0
8	11 29 58.73	9.621	4 7 26.4	61.97	12 24.5	Sept. 4	11 35 18.75	13.710	3 27 22.1	89.00	0 42.2
12	11 29 20.14	9.659	4 11 34.4	61.96	12 8.1	8	11 36 13.83	13.822	3 21 24.7	89.62	0 27.3
16	11 28 41.55	9.625	4 15 41.5	61.49	11 51.8	12	11 37 9.27	13.892	3 15 25.4	89.97	0 12.5
20	11 28 3.23	9.522	4 19 45.8	60.58	11 35.4	16	11 38 4.90	13.921	3 9 25.2	90.06	23 54.0
24	11 27 25.45	−9.356	+ 4 23 45.6	+59.26	11 19.0	20	11 39 0.57	13.910	+ 3 3 25.2	−89.89	23 39.2
28	11 26 48.46	9.128	4 27 39.3	57.55	11 2.7	24	11 39 56.12	13.859	2 57 26.4	89.44	23 24.4
Apr. 1	11 26 12.50	8.837	4 31 25.5	55.45	10 46.4	28	11 40 51.38	13.764	2 51 30.0	88.70	23 9.6
5	11 25 37.83	8.484	4 35 2.4	52.93	10 30.1	Oct. 2	11 41 46.18	13.624	2 45 37.1	87.67	22 54.8
9	11 25 4.70	8.069	4 38 28.6	50.01	10 13.8	6	11 42 40.32	13.437	2 39 48.9	86.35	22 39.9
13	11 24 33.35	−7.596	+ 4 41 42.5	+46.80	9 57.5	10	11 43 33.62	13.206	+ 2 34 6.6	−84.75	22 25.1
17	11 24 3.99	7.075	4 44 42.9	43.32	9 41.3	14	11 44 25.91	12.934	2 28 31.2	82.87	22 10.2
21	11 23 36.81	6.511	4 47 28.8	39.56	9 25.1	18	11 45 17.03	12.621	2 23 3.9	80.72	21 55.3
25	11 23 11.96	5.908	4 49 59.1	35.54	9 9.0	22	11 46 6.83	12.271	2 17 45.7	78.32	21 40.4
29	11 22 49.59	5.267	4 52 12.9	31.30	8 52.9	26	11 46 55.14	11.877	2 12 37.6	75.64	21 25.5
May 3	11 22 29.86	−4.590	+ 4 54 9.2	+26.84	8 36.9	30	11 47 41.79	11.439	+ 2 7 40.8	−72.68	21 10.6
7	11 22 12.91	3.880	4 55 47.4	22.21	8 20.9	Nov. 3	11 48 26.59	10.955	2 2 56.4	69.44	20 55.6
11	11 21 58.85	3.144	4 57 6.7	17.42	8 4.9	7	11 49 9.38	10.432	1 58 25.6	65.94	20 40.5
15	11 21 47.78	2.389	4 58 6.6	12.54	7 49.0	11	11 49 50.01	9.875	1 54 9.2	62.21	20 25.5
19	11 21 39.75	1.623	4 58 46.9	7.59	7 33.2	15	11 50 28.33	9.265	1 50 8.2	58.26	20 10.4
23	11 21 34.80	−0.849	+ 4 59 7.3	+ 2.60	7 17.3	19	11 51 4.23	+8.660	+ 1 46 23.4	−54.10	19 55.2
27	11 21 32.97	−0.066	4 59 7.7	− 2.42	7 1.6	23	11 51 37.56	7.999	1 42 55.7	49.72	19 40.0
31	11 21 34.28	+0.724	4 58 47.9	7.47	6 45.9	27	11 52 8.18	7.305	1 39 46.0	45.11	19 24.8
June 4	11 21 38.76	1.516	4 58 7.9	12.53	6 30.2	Dec. 1	11 52 35.96	6.579	1 36 55.0	40.32	19 9 5
8	11 21 46.41	2.306	4 57 7.6	17.56	6 14.6	5	11 53 0.78	5.826	1 34 23.6	35.37	18 54.2
12	11 21 57.20	+3.086	+ 4 55 47.4	−22.51	5 59.1	9	11 53 22.55	+5.055	+ 1 32 12.2	−30.29	18 38.8
16	11 22 11.08	3.851	4 54 7.6	27.36	5 43.6	13	11 53 41.20	4.266	1 30 21.3	25.11	18 23.4
20	11 22 27.99	4.601	4 52 8.6	32.11	5 28.2	17	11 53 56.66	3.462	1 28 51.3	19.85	18 7.9
24	11 22 47.87	5.336	4 49 50.8	36.76	5 12.8	21	11 54 8.88	2.642	1 27 42.6	14.50	17 52.4
28	11 23 10.66	6.054	4 47 14.6	41.31	4 57.4	25	11 54 17.79	1.810	1 26 55.4	9.09	17 36.8
July 2	11 23 36.29	+6.756	+ 4 44 20.4	−45.74	4 42.1	29	11 54 23.36	+0.972	+ 1 26 29.9	− 3.64	17 21.2
6	11 24 4.68	+7.436	+ 4 41 8.8	−50.01	4 26.9	33	11 54 25.57	+0.135	+ 1 26 26.3	+ 1.80	17 5.5

Greatest horizontal parallax,	March 14, 0″.51.	Greatest semidiameter,	March 14, 1″.94.
Least horizontal parallax,	September 16, 0″.46.	Least semidiameter,	September 16, 1″.74.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 3	2 56 58.07	−3.078	+14 57 43.4	− 9.82	8 4.5	July 2	3 13 31.55	+6.458	+16 10 50.9	+22.87	20 29.4
7	2 56 46.72	2.588	14 57 8.5	7.59	7 48.6	6	3 13 56.62	6.075	16 12 19.0	21.15	20 14.1
11	2 56 37.38	2.078	14 56 42.7	5.26	7 32.7	10	3 14 20.12	5.670	16 13 40.1	19.37	19 58.7
15	2 56 30.12	1.552	14 56 26.4	2.88	7 16.9	14	3 14 41.96	5.245	16 14 54.0	17.55	19 43.4
19	2 56 24.99	1.012	14 56 19.7	− 0.47	7 1.1	18	3 15 2.06	4.802	16 16 0.5	15.65	19 28.0
23	2 56 22.04	−0.462	+14 56 22 6	+ 1.93	6 45.3	22	3 15 20.36	+4.344	+16 16 59.3	+13.72	19 12.6
27	2 56 21.30	+0.092	14 56 35.1	4.32	6 29.6	26	3 15 36.80	3.870	16 17 50.3	11.77	18 57.1
31	2 56 22.77	0.646	14 56 57.2	6.70	6 13.9	30	3 15 51.30	3 380	16 18 33.4	9.75	18 41.6
Feb. 4	2 56 26.46	1.199	14 57 28.8	9.07	5 58.2	Aug. 3	3 16 3.81	2.877	16 19 8.4	7.70	18 26.1
8	2 56 32.36	1.747	14 58 9.9	11.45	5 42.6	7	3 16 14.29	2.362	16 19 35.0	5.63	18 10.6
12	2 56 40.43	+2.286	+14 59 0.4	+13.78	5 27.0	11	3 16 22.70	+1.838	+16 19 53.3	+ 3.55	17 55.0
16	2 56 50.65	2.817	15 0 0.0	16.02	5 11.4	15	3 16 29.00	1.310	16 20 3.4	+ 1.48	17 39.3
20	2 57 2.98	3.341	15 1 8.4	18.17	4 55.9	19	3 16 33.18	0.779	16 20 5.2	− 0.58	17 23.7
24	2 57 17.37	3.852	15 2 25.2	20.25	4 40.4	23	3 16 35.23	+0.247	16 19 58.7	2.62	17 8.0
28	2 57 33.77	4.345	15 3 50.2	22.22	4 25.0	27	3 16 35.16	−0.287	16 19 44.1	4.65	16 52.3
Mar. 4	2 57 52.11	+4.820	+15 5 22.9	+24.12	4 9.6	31	3 16 32.94	−0.820	+16 19 21.4	− 6.67	16 36.5
8	2 58 12.32	5.278	15 7 3.0	25.90	3 54.2	Sept. 4	3 16 28.61	1.347	16 18 50.7	8.65	16 20.7
12	2 58 34.32	5.716	15 8 50.0	27.60	3 38.8	8	3 16 22.20	1.863	16 18 12.2	10.58	16 4.9
16	2 58 58.02	6.130	15 10 43.6	29.20	3 23.5	12	3 16 13.75	2.364	16 17 26.1	12.46	15 49.0
20	2 59 23.32	6.520	15 12 43.3	30.62	3 8.2	16	3 16 3.31	2.853	16 16 32.6	14.25	15 33.1
24	2 59 50.13	+6.883	+15 14 48.4	+31.90	2 52.9	20	3 15 50.94	−3.328	+16 15 32.0	−16.00	15 17.1
28	3 0 18.35	7.220	15 16 58.4	33.07	2 37.6	24	3 15 36.72	3.782	16 14 24.7	17.63	15 1.2
Apr. 1	3 0 47.86	7.530	15 19 12.8	34.10	2 22.4	28	3 15 20.73	4.208	16 13 11.1	19.15	14 45.2
5	3 1 18.55	7.812	15 21 31.0	34.99	2 7.2	Oct. 2	3 15 3.07	4.615	16 11 51.6	20.57	14 29.2
9	3 1 50.32	8.067	15 23 52.5	35.75	1 52.0	6	3 14 43.84	4.995	16 10 26.7	21.87	14 13.1
13	3 2 23.06	+8.293	+15 26 16.8	+36.37	1 36.8	10	3 14 23.16	−5.342	+16 8 56.7	−23.07	13 57.0
17	3 2 56.64	8.488	15 28 43.3	36.86	1 21 6	14	3 14 1.15	5.655	16 7 22.2	24.12	13 40.9
21	3 3 30.93	8.650	15 31 11.5	37.22	1 6.4	18	3 13 37.95	5.934	16 5 43.9	25.02	13 24.8
25	3 4 5.81	8.782	15 33 40.9	37.45	0 51.3	22	3 13 13.71	6.175	16 4 2.3	25.77	13 8.7
29	3 4 41.16	8.885	15 36 10.9	37.54	0 36.2	26	3 12 48.58	6.379	16 2 17.9	26.38	12 52.5
May 3	3 5 16.86	+8.958	+15 38 41.0	+37.50	0 21.0	30	3 12 22.71	−6.545	+16 0 31.3	−26.82	12 36.4
7	3 5 52.79	9.000	15 41 10.7	37.33	0 5.9	Nov. 3	3 11 56.26	6.671	15 58 43.4	27.08	12 20.2
11	3 6 28.82	9.010	15 43 39.5	37.02	23 46.8	7	3 11 29.40	6.751	15 56 54.8	27.17	12 4.0
15	3 7 4.83	8.988	15 46 6.8	36.59	23 31.7	11	3 11 2.32	6.786	15 55 6.2	27.09	11 47.9
19	3 7 40.69	8.935	15 48 32.1	36.02	23 16.6	15	3 10 35.19	6 775	15 53 18.3	26.83	11 21.7
23	3 8 16.28	+8.852	+15 50 54.8	+35.32	23 1.4	19	3 10 8.18	−6.722	+15 51 31.7	−26.40	11 15.5
27	3 8 51.47	8.740	15 53 14.5	34.52	22 46.3	23	3 9 41.47	6.625	15 49 47.2	25.80	10 59.3
31	3 9 26.15	8.598	15 55 30.8	33.62	22 31.1	27	3 9 15.23	6.485	15 48 5.5	25.02	10 43.2
June 4	3 10 0.21	8.428	15 57 43.3	32 62	22 16.0	Dec. 1	3 8 49.64	6.304	15 46 27.2	24.07	10 27.0
8	3 10 33.53	8.228	15 59 51.6	31.52	22 0.8	5	3 8 24.86	6.082	15 44 53.1	22.95	10 10.9
12	3 11 5.98	+7.998	+16 1 55.3	+30.32	21 45.6	9	3 8 1.04	−5.819	+15 43 23.8	−21.65	9 54.8
16	3 11 37.46	7.740	16 3 54.0	29.02	21 30.4	13	3 7 38.35	5.515	15 42 0.0	20.20	9 38.7
20	3 12 7.86	7.456	16 5 47.3	27.62	21 15.2	17	3 7 16.94	5.180	15 40 42.3	18.62	9 22.6
24	3 12 37.07	7.147	16 7 34.8	26.12	21 0.0	21	3 6 56.96	4.809	15 39 31.2	16.95	9 6.5
28	3 13 5.00	6.815	16 9 16.1	24.53	20 44.7	25	3 6 38.52	4.407	15 38 26.9	15.17	8 50.5
July 2	3 13 31.55	+6.458	+16 10 50.9	+22.87	20 29.4	29	3 6 21.73	−3.980	+15 37 29.9	−13.25	8 34.5
6	3 13 56.62	+6.075	+16 12 19.0	+21.15	20 14.1	33	3 6 6.73	−3.527	+15 36 40.9	−11.20	8 18.5

Greatest horizontal parallax, November 11, 0″.31.
Least horizontal parallax, May 10, 0″.29.

Greatest semidiameter, November 11, 1″.33.
Least semidiameter, May 10, 1″.25.

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	311 26 10.1	3 26 30.1	+ 2 26.9	− 6 58 15.3	− 2 23.9	9.6223266	0.1331487	0.1295088
3	318 29 10.3	3 36 43.9	− 0 41.4	7 0 1.4	+ 0 42.4	9.6118536	0.1255843	0.1213599
5	325 54 3.1	3 48 23.4	3 56.7	6 55 5.9	4 18.4	9.6004016	0.1168194	0.1119458
7	333 43 43.6	4 1 31.9	7 5.8	6 42 26.1	8 27.1	9.5880614	0.1067205	0.1011234
9	342 1 11.0	4 16 10.2	9 51.6	6 20 54.3	13 10.5	9.5749742	0.0951343	0.0887312
11	350 49 20.9	4 32 13.4	− 11 53.8	− 5 49 22.0	+ 18 27.0	9.5613503	0.0818924	0.0745949
13	0 10 52.6	4 49 28.9	12 50.5	5 6 48.5	24 10.0	9.5474869	0.0668167	0.0585369
15	10 7 49.0	5 7 32.7	12 21.5	4 12 33.9	30 4.9	9.5337874	0.0497358	0.0403970
17	20 41 9.1	5 25 44.7	10 14.0	3 6 37.4	35 46.8	9.5207694	0.0305085	0.0200635
19	31 50 15.5	5 43 8.1	6 29.8	1 49 59.8	40 37.7	9.5090553	0.0090634	9.9975200
21	43 32 20.5	5 58 30.0	− 1 31.9	− 0 25 3.7	+ 43 57.4	9.4993328	9.9854582	9.9729172
23	55 41 58.5	6 10 26.9	+ 3 53.4	+ 1 4 17.4	44 57.4	9.4922784	9.9599551	9.9466506
25	68 10 57.8	6 17 39.2	8 43.0	2 32 53.3	43 9.0	9.4884505	9.9331051	9.9194438
27	80 48 46.2	6 19 8.9	11 55.7	3 54 58.9	38 29.3	9.4881769	9.9058172	9.8923977
29	93 23 32.1	6 14 37.5	12 51.1	5 5 15.3	31 27.3	9.4914817	9.8793783	9.8669666
31	105 43 33.0	6 4 32.1	+ 11 23.3	+ 5 59 49.3	+ 22 57.3	9.4980796	9.8553762	9.8448180
Feb. 2	117 38 42.0	5 49 59.2	8 0.3	6 36 47.1	14 1.2	9.5074403	9.8354894	9.8275605
4	129 1 30.2	5 32 26.8	+ 3 29.4	6 56 12.6	+ 5 32.6	9.5188979	9.8211647	9.8163907
6	139 47 29.2	5 13 24.3	− 1 17.1	6 59 39.7	− 1 53.1	9.5317605	9.8132757	9.8118047
8	149 54 58.0	4 54 7.4	5 36.8	6 49 33.1	7 59.8	9.5453926	9.8119171	9.8135112
10	159 24 27.0	4 35 32.1	− 9 3.8	+ 6 28 34.2	− 12 46.2	9.5592594	9.8164543	9.8205931
12	168 17 58.0	4 18 13.8	11 25.1	5 59 17.2	16 19.6	9.5729410	9.8257669	9.8318116
14	176 38 26.2	4 2 31.3	12 38.4	5 23 56.9	18 51.6	9.5861247	9.8385703	9.8456969
16	184 29 11.8	3 48 31.6	12 49.5	4 44 23.8	20 34.2	9.5985883	9.8536604	9.8617436
18	191 53 40.8	3 36 14.2	12 7.2	4 2 5.8	21 38.2	9.6101816	9.8700456	9.8784817
20	198 55 13.5	3 25 34.3	− 10 41.9	+ 3 18 10.4	− 22 13.0	9.6208069	9.8869804	9.8954828
22	205 36 58.5	3 16 25.3	8 44.6	2 33 28.4	22 25.8	9.6304065	9.9039402	9.9123154
24	212 1 50.1	3 8 39.5	6 25.3	1 48 37.9	22 22.3	9 6389477	9.9205776	9.9287034
26	218 12 27.1	3 2 9.5	3 52.7	1 4 7.4	22 6.5	9.6464171	9.9366755	9.9444802
28	224 11 14.6	2 56 49.0	− 1 14.4	+ 0 20 18.0	21 41.7	9.6528117	9.9521088	9.9595555
Mar. 2	230 0 25.8	2 52 32.2	+ 1 22.9	− 0 22 34.5	− 21 9.8	9.6581356	9.9668164	9.9738896
4	235 42 2.9	2 49 14.3	3 53.4	1 4 17.4	20 32.4	9.6623954	9.9807766	9.9874777
6	241 17 59.7	2 46 51.4	6 12.3	1 44 40.7	19 50.2	9.6655992	9.9939951	0.0003327
8	246 50 3.2	2 45 20.6	8 15.5	2 23 35.5	19 3.9	9.6677542	0.0064935	0.0124805
10	252 19 55.7	2 44 40.1	9 59.7	3 0 53.5	18 13.4	9.6688660	0.0182991	0.0239527
12	257 49 16.5	2 44 48.8	+ 11 21.5	− 3 36 26.0	− 17 18.6	9.6689372	0.0294458	0.0347824
14	263 19 43.3	2 45 46.2	12 18.3	4 10 3.7	16 18.4	9.6679678	0.0399663	0.0450015
16	268 52 54.2	2 47 33.0	12 48.1	4 41 35.5	15 12.4	9.6659555	0.0498917	0.0546407
18	274 30 29.3	2 50 10.7	12 48.9	5 10 48.6	13 59.4	9.6628951	0.0592505	0.0637237
20	280 14 12.3	2 53 41.3	12 19.3	5 37 27.4	12 37.8	9.6587799	0.0680625	0.0722690
22	286 5 51.9	2 58 7.8	+ 11 18.7	− 6 1 12.8	− 11 5.7	9.6536016	0.0763441	0.0802883
24	292 7 23.5	3 3 34.0	9 47.1	6 21 41.8	9 20.9	9.6473532	0.0841021	0.0877850
26	298 20 50.8	3 10 4.4	7 45.4	6 38 26.3	7 20.8	9.6400304	0.0913358	0.0947533
28	304 48 27.3	3 17 44.2	5 16.4	6 50 52.5	5 2.0	9.6316344	0.0980348	0.1011708
30	311 32 37.3	3 26 38.7	+ 2 24.1	6 58 19.7	− 2 21.2	9.6221773	0.1041764	0.1070273
32	318 35 55.8	3 36 53.7	− 0 44.4	− 7 0 0.1	+ 0 45.5	9.6116883	0.1097247	0.1122613
34	326 1 9.5	3 48 34.6	− 3 59.6	− 6 54 58.0	+ 4 21.9	9 6002213	0.1146293	

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 1	318 35 55.8	3 36 53.7	− 0 44.4	− 7 0 0.1	+ 0 45.5	9.6116883	0.1097247	0.1122613
3	326 1 9.5	3 48 34.6	3 59.6	6 54 58.0	4 21.9	9.6002213	0.1146293	0.1168199
5	333 51 13.9	4 1 44.8	7 8.6	6 42 10.6	8 31.2	9.5878680	0.1188224	0.1206255
7	342 9 7.1	4 16 24.0	9 53.8	6 20 30.2	13 15.0	9.5747700	0.1222161	0.1235798
9	350 57 47.0	4 32 28.6	11 55.2	5 48 48.3	18 32.0	9.5611389	0.1247007	0.1255617
11	0 19 50.5	4 49 45.2	− 12 50.8	− 5 6 4.5	+ 24 15.3	9.5472740	0.1261437	0.1264270
13	10 17 19.7	5 7 49.3	12 20.4	4 11 39.0	30 10.3	9.5335798	0.1263901	0.1260108
15	20 51 13.3	5 26 1.3	10 11.6	3 5 32.1	35 51.7	9.5205760	0.1252660	0.1241326
17	32 0 52.1	5 43 23.6	6 25.8	1 48 45.5	40 43.0	9.5088864	0.1225876	0.1206090
19	43 43 26.1	5 58 43.2	− 1 27.0	− 0 23 43.4	43 59.5	9.4991989	0.1181764	0.1152711
21	55 53 27.1	6 10 36.5	+ 3 58.1	+ 1 5 39.7	+ 44 57.2	9.4921896	0.1118781	0.1079858
23	68 22 40.9	6 17 43.9	8 46.8	2 34 12.4	43 6.1	9.4884136	0.1035867	0.0986784
25	81 0 33.2	6 19 8.2	11 57.6	3 56 9.5	38 23.8	9.4881948	0.0932634	0.0873493
27	93 35 12.2	6 14 31.4	12 50.8	5 6 13.1	31 20.1	9.4915531	0.0809488	0.0740781
29	105 54 56.1	6 4 21.4	11 20.9	6 0 31.6	22 49.1	9.4981978	0.0667580	0.0590125
May 1	117 49 39.8	5 49 44.8	+ 7 56.4	+ 6 37 12.9	+ 13 53.0	9.5075962	0.0508670	0.0423498
3	129 11 56.8	5 32 10.4	+ 3 25.5	6 56 22.8	+ 5 25.2	9.5190806	0.0334892	0.0243142
5	139 57 22.0	5 13 7.0	− 1 20.7	6 59 36.1	− 1 59.4	9.5319602	0.0148542	0.0051380
7	150 4 15.7	4 53 50.1	5 40.5	6 49 18.1	8 4.9	9.5456003	9.9951935	9.9850479
9	159 33 11.0	4 35 15.8	9 6.6	6 28 10.3	12 50.0	9.5594677	9.9747279	9.9642601
11	168 26 10.7	4 17 58.7	− 11 26.7	+ 5 58 46.7	− 16 22.4	9.5731447	9.9536702	9.9429836
13	176 46 10.1	4 2 17.6	12 39.0	5 23 21.5	18 53.6	9.5863195	9.9322260	9.9214232
15	184 36 30.1	3 48 19.6	12 49.2	4 43 45.3	20 35.4	9.5987713	9.9106018	9.8997886
17	192 0 36.6	3 36 3.6	12 6.1	4 1 25.2	21 39.0	9.6103510	9.8890120	9.8783021
19	199 1 49.7	3 25 25.2	10 40.3	3 17 28.6	22 13.4	9.6209617	9.8676901	9.8572096
21	205 43 17.9	3 16 17.5	− 8 42.6	+ 2 32 46.1	− 22 26.0	9.6305456	9.8468961	9.8367878
23	212 7 55.1	3 8 32.9	6 23.0	1 47 55.8	22 22.1	9.6390709	9.8269243	9.8173488
25	218 18 20.0	3 2 4.2	3 50.2	1 3 25.8	22 6.2	9.6465242	9.8081065	9.7992454
27	224 16 57.4	2 56 44.8	− 1 11.8	+ 0 19 37.1	21 41.2	9.6529027	9.7908145	9.7828642
29	230 6 0.6	2 52 29.0	+ 1 25.2	− 0 23 14.3	21 9.2	9.6582105	9.7754464	9.7686133
31	235 47 31.9	2 49 11.7	+ 3 55.6	− 1 4 56.0	− 20 31.7	9.6624544	9.7624158	9.7569033
June 2	241 23 24.1	2 46 49.4	6 14.4	1 45 18.0	19 49.6	9.6656422	9.7521224	9.7481154
4	246 55 24.1	2 45 19.4	8 17.3	2 24 11.3	19 3.2	9.6677814	9.7449190	9.7425645
6	252 25 15.1	2 44 39.8	10 1.3	3 1 27.7	18 12.6	9.6688773	9.7410747	9.7404650
8	257 54 36.2	2 44 49.2	11 22.6	3 36 58.5	17 17.5	9.6689325	9.7407425	9.7419043
10	263 25 4.7	2 45 47.4	+ 12 19.0	− 4 10 34.2	− 16 17.4	9.6679172	9.7439397	9.7468288
12	268 58 18.8	2 47 35.0	12 48.4	4 42 4.0	15 11.4	9.6659188	9.7505442	9.7550519
14	274 35 58.8	2 50 13.5	12 48.7	5 11 14.9	13 58.2	9.6628422	9.7603117	9.7662785
16	280 19 48.3	2 53 44.9	12 18.5	5 37 51.1	12 36.4	9.6587105	9.7729043	9.7801388
18	286 11 35.8	2 58 12.3	11 17.5	6 1 33.6	11 4.2	9.6535155	9.7879301	9.7962260
20	292 13 17.3	3 3 39.6	+ 9 45.5	− 6 21 59.3	− 9 19.2	9.6472506	9.8049750	9.8141265
22	298 26 56.9	3 10 11.0	7 43.2	6 38 40.1	7 18.8	9.6399110	9.8236321	9.8334460
24	304 54 47.6	3 17 51.7	5 13.9	6 51 1.9	4 59.6	9.6314983	9.8435242	9.8538249
26	311 39 13.9	3 26 47.6	+ 2 21.4	6 58 24.5	− 2 18.5	9.6220248	9.8643092	9.8749404
28	318 42 51.7	3 37 4.0	− 0 47.4	6 59 58.6	+ 0 48.6	9.6115200	9.8856844	9.8965083
30	326 8 27.3	3 48 46.2	− 4 2.6	− 6 54 49.8	+ 4 25.5	9.6000383	9.9073818	9.9182764
32	333 58 55.9	4 1 57.3	− 7 11.3	− 6 41 54.6	+ 8 35.3	9.5876717	9.9291640	

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 2	333 58 55.9	4 1 57.3	− 7 11.3	− 6 41 54.6	+ 8 35.3	9.5876717	9.9291640	9.9400176
4	342 17 16.7	4 16 38.2	9 56.1	6 20 5.4	13 19.7	9.5745634	9.9508116	9.9615201
6	351 6 25.7	4 32 44.1	11 56.6	5 48 13.7	18 37.2	9.5609258	9.9721177	9.9825783
8	0 29 1.3	4 50 1.7	12 51.1	5 5 19.2	24 20.8	9.5470600	9.9928760	0.0029831
10	10 27 4.1	5 8 6.2	12 19.2	4 10 42.7	30 15.8	9.5333719	0.0128733	0.0225178
12	21 1 31.4	5 26 18.0	− 10 8.8	− 3 4 25.2	+ 35 56.8	9.5203830	0.0318881	0.0409552
14	32 11 42.7	5 43 39.2	6 21.6	1 47 29.5	40 46.9	9.5087185	0.0496895	0.0580619
16	43 54 45.5	5 58 56.2	− 1 21.9	− 0 22 21.3	44 1.6	9.4990670	0.0660444	0.0736102
18	56 5 8.9	6 10 45.6	+ 4 3.1	+ 1 7 3.5	44 56.8	9.4921036	0.0807346	0.0873959
20	68 34 35.9	6 17 48.9	8 50.7	2 35 32.8	43 3.0	9.4883805	0.0935762	0.0992619
22	81 12 30.8	6 19 6.7	+ 11 59.5	+ 3 57 21.1	+ 38 18.2	9.4882179	0.1044434	0.1091176
24	93 47 1.4	6 14 24.6	12 50.4	5 7 11.5	31 12.7	9.4916298	0.1132848	0.1169513
26	106 6 26.7	6 4 9.7	11 18.6	6 1 14.1	22 40.8	9.4983215	0.1201269	0.1228261
28	118 0 43.2	5 49 29.8	7 52.7	6 37 38.7	13 44.8	9.5077577	0.1250663	0.1268672
30	129 22 27.9	5 31 53.1	+ 3 21.0	6 56 32.8	+ 5 17.8	9.5192693	0.1282499	0.1292379
Aug. 1	140 7 17.5	5 12 48.9	− 1 25.1	+ 6 59 32.3	− 2 5.7	9.5321657	0.1298535	0.1301195
3	150 13 35.8	4 53 32.5	5 44.2	6 49 3.0	8 9.9	9.5458135	0.1300582	0.1296909
5	159 41 56.5	4 34 58.9	9 9.3	6 27 46.3	12 53.9	9.5596811	0.1290379	0.1281186
7	168 34 23.9	4 17 43.4	11 28.3	5 58 16.0	16 25.2	9.5733528	0.1269498	0.1255476
9	176 53 54.3	4 2 3.9	12 39.7	5 22 46.1	18 55.6	9.5865183	0.1239269	0.1221007
11	184 43 48.4	3 48 7.4	− 12 48.9	+ 4 43 6.6	− 20 36.7	9.5989581	0.1200809	0.1178782
13	192 7 32.0	3 35 53.0	12 4.9	4 0 44.6	21 39.8	9.6105236	0.1155013	0.1129586
15	199 8 25.6	3 25 16.1	10 38.6	3 16 46.9	22 13.8	9.6211189	0.1102569	0.1074025
17	205 49 36.8	3 16 9.6	8 40.6	2 32 4.0	22 26 0	9 6306868	0.1044001	0.1012536
19	212 13 59.6	3 8 26.2	6 20.7	1 47 13.8	22 22.0	9.6391957	0.0979663	0.0945407
21	218 24 12.5	3 1 58.6	− 3 47.8	+ 1 2 44.2	− 22 5.9	9.6466322	0.0909784	0.0872803
23	224 22 40.2	2 56 40.2	− 1 9.5	+ 0 18 56.3	21 40.7	9.6529940	0.0834469	0.0794780
25	230 11 35.5	2 52 25.2	+ 1 27.6	− 0 23 54.0	21 8.6	9.6582851	0.0753728	0.0711301
27	235 53 0.3	2 49 9.0	3 57.8	1 5 34.6	20 31.1	9.6625124	0.0667483	0.0622248
29	241 28 48.1	2 46 47.7	6 16.3	1 45 55.3	19 48.9	9.6656839	0.0575575	0.0527432
31	247 0 45.9	2 45 18.5	+ 8 19.1	− 2 24 47.2	− 19 2.4	9.6678066	0.0477784	0.0426602
Sept. 2	252 30 35.7	2 44 39.6	10 2.7	3 2 2.0	18 11.7	9.6688860	0.0373842	0.0319470
4	257 59 56.9	2 44 49.8	11 23.7	3 37 31.1	17 16.6	9.6689248	0.0263441	0.0205714
6	263 30 27.3	2 45 48.8	12 19.7	4 11 4.9	16 16.4	9.6679230	0.0146251	0.0085008
8	269 3 44.9	2 47 37.1	12 48.6	4 42 32.7	15 10.3	9.6658781	0.0021950	9.9957042
10	274 41 29.7	2 50 16.4	+ 12 48.4	− 5 11 41.2	− 13 57.0	9.6627849	9.9890254	9.9821561
12	280 25 25.8	2 53 48.7	12 17.8	5 38 14.8	12 35.1	9.6586367	9.9750951	9.9678424
14	286 17 21.9	2 58 17.0	11 16.3	6 1 54.5	11 2.7	9.6534252	9.9603992	9.9527686
16	292 19 13.8	3 3 45.2	9 43.8	6 22 16.9	9 17.4	9.6471435	9.9449567	9.9369727
18	298 33 5.7	3 10 17.7	7 41.2	6 38 53.8	7 16.7	9.6397872	9.9288287	9.9205414
20	305 1 11.1	3 17 59.6	+ 5 11.3	− 6 51 11.3	− 4 57.4	9.6313580	9.9121342	9.9036367
22	311 45 54.3	3 26 56.6	+ 2 18.5	6 58 28.4	− 2 15.8	9.6218684	9.8950861	9.8865293
24	318 49 51.3	3 37 14 4	− 0 50.4	6 59 57.1	+ 0 51.8	9.6113481	9.8780239	9.8696405
26	326 15 48.9	3 48 57.8	4 5.7	6 54 41.4	4 29.2	9.5998525	9.8614635	9.8535919
28	334 6 42.3	4 2 10.6	7 14.1	6 41 38.4	8 39.5	9.5874735	9.8461411	9.8392422
30	342 25 31.0	4 16 52.8	− 9 58.3	− 6 19 40.2	+ 13 24.4	9.5743556	9.8330409	9.8276934
32	351 15 10.3	4 32 59.8	− 11 58.0	− 5 47 38.5	+ 18 42.4	9.5607124	9.8233641	

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 2	351 15 10.3	4 32 59 8	− 11 58.0	− 5 47 38.5	+ 18 42.4	9.5607124	9.8233641	9.8202165
4	0 38 18.1	4 50 18.0	12 51.3	5 4 33.2	24 26.2	9.5468465	9.8184056	9.8180681
6	10 36 54.7	5 8 23.3	12 17.9	4 9 45.8	30 21.4	9.5331656	9.8193097	9.8221968
8	21 11 55.9	5 26 34.7	10 5.7	3 3 17.4	36 1.8	9.5201929	9.8267495	9.8329348
10	32 22 39.4	5 43 54.4	6 17.3	1 46 12.8	40 50.8	9.5085547	9.8406700	9.8498244
12	44 6 10.2	5 59 8.9	− 1 16.8	− 0 20 58.5	+ 44 3.6	9.4989404	9.8602310	9.8716927
14	56 16 55.4	6 10 54.6	+ 4 8.0	+ 1 8 27.9	44 56.3	9.4920236	9.8840000	9.8969359
16	68 46 35.1	6 17 51.7	8 54.5	2 36 53.6	42 59.8	9.4883541	9.9102927	9.9238747
18	81 24 32.1	6 19 4.9	12 1.4	3 58 32.9	38 12.5	9.4882472	9.9375047	9.9510298
20	93 58 53.4	6 14 17.1	12 50.0	5 8 9.9	31 5.2	9.4917126	9.9643218	9.9772761
22	106 17 58.8	6 3 57.6	+ 11 16.2	+ 6 1 56.5	+ 22 32.4	9.4984511	9.9898113	0 0018670
24	118 11 47.5	5 49 14.2	7 48.8	6 38 4.3	13 36.5	9.5079243	0.0134013	0.0243881
26	129 32 58.8	5 31 35.5	+ 3 16.5	6 56 42.6	+ 5 10.3	9.5194623	0.0348147	0.0446784
28	140 17 12.3	5 12 30.6	− 1 29.4	6 59 28.3	− 2 12.0	9.5323744	0.0539848	0.0627464
30	150 22 54.2	4 53 14.6	5 47.8	6 48 47.6	8 15.0	9.5460290	0.0709794	0.0787030
Nov. 1	159 50 40.3	4 34 42.2	− 9 12.1	+ 6 27 22.1	− 12 57.6	9.5598962	0.0859385	0.0927086
3	168 42 35.3	4 17 27.9	11 29.9	5 57 45.3	16 28.0	9.5735617	0.0990360	0.1049431
5	177 1 36.4	4 1 50.1	12 40.3	5 22 10.7	18 57.5	9.5867169	0.1104519	0.1155832
7	184 54 4.4	3 47 55.1	12 48.6	4 42 28.1	20 38.0	9.5991437	0.1203571	0.1247927
9	192 14 25.1	3 35 42.4	12 4.1	4 0 4.2	21 40.5	9.6106945	0.1289079	0.1327193
11	199 14 58.6	3 25 6.9	− 10 37.1	+ 3 16 5.4	− 22 14.1	9.6212738	0.1362417	0.1394892
13	205 55 52.9	3 16 1.9	8 38.5	2 31 22.2	22 26.0	9.6308251	0.1424750	0.1452109
15	212 20 1.3	3 8 19.7	6 18.5	1 46 32.1	22 21.9	9.6393171	0.1477078	0.1499754
17	218 30 2.1	3 1 53.2	3 45.3	1 2 3.0	22 5.6	9.6467367	0.1520226	0.1538575
19	224 28 20.2	2 56 35.8	− 1 7.0	+ 0 18 15.9	21 40.3	9.6530817	0.1554873	0.1569183
21	230 17 7.9	2 52 21.8	+ 1 30.0	− 0 24 33.6	− 21 8.1	9.6583559	0.1581559	0.1592053
23	235 58 26.7	2 49 6.5	4 0.2	1 6 13.0	20 30.4	9.6625666	0.1600706	0.1607554
25	241 34 10.5	2 46 46.1	6 18.4	1 46 32.4	19 48.1	9.6657216	0.1612628	0.1615954
27	247 6 5.8	2 45 17.7	8 20.9	2 25 22.9	19 1.6	9.6678280	0.1617547	0.1617422
29	252 35 54.7	2 44 39.4	10 4.1	3 2 36.1	18 10.9	9.6688912	0.1615588	0.1612048
Dec. 1	258 5 16.4	2 44 50.3	+ 11 24.8	− 3 38 3.5	− 17 15.7	9.6689140	0.1606799	0.1599834
3	263 35 48.7	2 45 50.1	12 20.4	4 11 35 5	16 15.4	9.6678961	0.1591137	0.1580695
5	269 9 9.8	2 47 39.4	12 48.9	4 43 1.1	15 9.1	9.6658353	0.1568482	0.1554471
7	274 47 0.1	2 50 19.5	12 48.2	5 12 7.4	13 55.7	9.6627261	0.1538626	0.1520909
9	280 31 3.1	2 53 52.6	12 17.1	5 38 38.4	12 33.7	9.6585618	0.1501271	0.1479659
11	286 23 7.7	2 58 21.7	+ 11 15.1	− 6 2 15.2	− 11 1.1	9.6533341	0.1456012	0.1430264
13	292 25 9.9	3 3 50.8	9 42.1	6 22 34.3	9 15.7	9.6470361	0.1402341	0.1372158
15	298 39 14.0	3 10 24.4	7 39.1	6 39 7.5	7 14.7	9.6396638	0.1339626	0.1304642
17	305 7 33.9	3 18 7.5	5 8.8	6 51 20.6	4 55.0	9.6312186	0.1267098	0.1226876
19	311 52 34.0	3 27 5.7	+ 2 15.6	6 58 32.7	− 2 13.0	9.6217133	0.1183846	0.1137864
21	318 56 50.4	3 37 24.6	− 0 53.5	− 6 59 55.4	+ 0 55.0	9.6111781	0.1088781	0.1036437
23	326 23 9.7	3 49 9.3	4 8.8	6 54 32.9	4 32.8	9.5996686	0.0980655	0.0921263
25	334 14 27.4	4 2 23.4	7 16.9	6 41 22.1	8 43.7	9.5872780	0.0858065	0.0790860
27	342 33 43.1	4 17 7.0	10 0.6	6 19 15.0	13 29.2	9.5741513	0.0719449	0.0643625
29	351 23 52.0	4 33 15.2	11 59.5	5 47 3.4	18 47.5	9.5605033	0.0563186	0.0477953
31	0 47 31.4	4 50 34.4	− 12 51.5	− 5 3 47.5	+ 24 31.8	9.5466375	0.0387739	0.0292407
33	10 46 40.8	5 8 39 9	− 12 16.7	− 4 8 48.9	+ 30 26.8	9.5329641	0.0191858	

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 3	119 30 59.8	1 37 25.4	+ 3 0.8	+ 2 21 14.1	+ 4 9.4	9.8564188	9.5582487	9.5727457
7	126 0 48.4	1 37 28.7	2 57.8	2 36 55.3	3 40.7	9.8563785	9.5872167	9.6016034
11	132 30 48.2	1 37 31.0	2 45.5	2 50 35.7	3 9.1	9.8563759	9.6158590	9.6299481
15	139 0 54.7	1 37 32.0	2 24.9	3 2 4.7	2 35.0	9.8564109	9.6438433	9.6575247
19	145 31 3.0	1 37 31.8	1 56.8	3 11 13.2	1 58.9	9.8564832	9.6709765	9.6841860
23	152 1 7.5	1 37 30.2	+ 1 22.7	+ 3 17 54.3	+ 1 21.3	9.8565917	9.6971450	9.7098471
27	158 31 2.6	1 37 27.1	0 44.4	3 22 2.8	0 42.8	9.8567349	9.7222879	9.7344647
31	165 0 42.8	1 37 22.7	+ 0 3.9	3 23 35.9	+ 0 3.8	9.8569110	9.7463770	9.7580263
Feb. 4	171 30 2.5	1 37 16.9	− 0 36.8	3 22 32.7	− 0 35.2	9.8571176	9.7694156	9.7805496
8	177 58 56.6	1 37 9.9	1 15.6	3 18 54.4	1 13.7	9.8573520	9.7914339	9.8020753
12	184 27 20.4	1 37 1.8	− 1 50.5	+ 3 12 44.5	− 1 51.1	9.8576111	9.8124811	9.8226582
16	190 55 9.6	1 36 52.7	2 19.7	3 4 8.2	2 26.8	9.8578916	9.8326138	9.8423542
20	197 22 20.6	1 36 42.8	2 41.8	2 53 12.7	3 0.5	9.8581899	9.8518852	9.8612124
24	203 48 50.9	1 36 32.3	2 55.8	2 40 7.0	3 31.8	9.8585021	9.8703406	9.8792737
28	210 14 38.5	1 36 21.4	3 1.0	2 25 1.6	4 0.3	9.8588243	9.8880158	9.8965709
Mar. 4	216 39 42.3	1 36 10.5	− 2 57.0	+ 2 8 8.6	− 4 25.6	9.8591523	9.9049441	9.9131404
8	223 4 2.2	1 35 59.6	2 44.2	1 49 41.0	4 47.5	9.8594822	9.9211644	9.9290214
12	229 27 39.1	1 35 49.0	2 23.3	1 29 53.2	5 5.8	9.8598096	9.9367170	9.9442570
16	235 50 34.6	1 35 39.0	1 55.4	1 9 0.2	5 20.1	9.8601307	9.9516465	9.9588895
20	242 12 51.0	1 35 29.5	1 21.7	0 47 17.9	5 30.4	9.8604414	9.9659921	9.9729568
24	248 34 31.3	1 35 20.9	− 0 44.1	+ 0 25 2.5	− 5 36.9	9.8607380	9.9797867	9.9864846
28	254 55 39.1	1 35 13.2	− 0 4.5	+ 0 2 30.4	5 38.7	9.8610167	9.9930529	9.9994938
Apr. 1	261 16 18.4	1 35 6.6	+ 0 35.4	− 0 20 1.9	5 36.7	9.8612744	0.0058095	0.0120024
5	267 36 33.6	1 35 1.1	1 13.5	0 42 18.0	5 30.6	9.8615078	0.0180747	0.0240296
9	273 56 29.3	1 34 56.8	1 48.0	1 4 1.8	5 20.6	9.8617143	0.0298695	0.0355979
13	280 16 10.1	1 34 53.7	+ 2 17.2	− 1 24 57.6	− 5 6.7	9.8618912	0.0412180	0.0467327
17	286 35 40.6	1 34 51.7	2 39.8	1 44 50.5	4 49.1	9.8620365	0.0521450	0.0574571
21	292 55 5.3	1 34 50.8	2 54.5	2 3 26.1	4 28.1	9.8621486	0.0626704	0.0677871
25	299 14 28.5	1 34 50.9	3 0.8	2 20 31.3	4 3.9	9.8622260	0.0728082	0.0777344
29	305 33 54.3	1 34 52.0	2 58.3	2 35 53.7	3 36.8	9.8622679	0.0825665	0.0873053
May 3	311 53 26.2	1 34 54.0	+ 2 47.1	− 2 49 22.3	− 3 7.1	9.8622739	0.0919517	0.0965067
7	318 13 7.5	1 34 56.8	2 27.9	3 0 47.3	2 35.1	9.8622437	0.1009718	0.1053488
11	324 33 1.0	1 35 0.2	2 1.4	3 10 0.5	2 1.2	9.8621779	0.1096394	0.1138452
15	330 53 9.2	1 35 4.1	1 29.0	3 16 55.0	1 25.8	9.8620769	0.1179681	0.1220100
19	337 13 34.1	1 35 8.5	0 52.3	3 21 25.6	0 49.3	9.8619422	0.1259720	0.1298546
23	343 34 17.4	1 35 13.3	+ 0 13.0	− 3 23 28.7	− 0 12.1	9.8617752	0.1336586	0.1373849
27	349 55 20.6	1 35 18.4	− 0 27.0	3 23 2.5	+ 0 25.3	9.8615781	0.1410334	0.1446042
31	356 16 44.7	1 35 23.7	1 5.7	3 20 6.8	1 2.5	9.8613530	0.1480973	0.1515126
June 4	2 38 30.7	1 35 29.3	1 41.2	3 14 43.5	1 39.1	9.8611027	0.1548510	0.1581128
8	9 0 39.4	1 35 35.0	2 11.8	3 6 55.9	2 14.6	9.8608301	0.1612992	0.1644115
12	15 23 11.3	1 35 40.9	− 2 35.9	− 2 56 49.2	+ 2 48.6	9.8605386	0.1674508	0.1704181
16	21 46 7.2	1 35 47.0	2 52.3	2 44 30.6	3 20.5	9.8602318	0.1733144	0.1761407
20	28 9 27.7	1 35 53.3	3 0.3	2 30 8.5	3 50.2	9.8599132	0.1788978	0.1815855
24	34 33 13.5	1 35 59.7	2 59.3	2 13 53.1	4 17.1	9.8595871	0.1842042	0.1867537
28	40 57 25.3	1 36 6.3	2 49.4	1 55 56.2	4 40.9	9.8592572	0.1892339	0.1916443
July 2	47 22 3.7	1 36 13.0	− 2 31.0	− 1 36 30.8	+ 5 1.2	9.8589279	0.1939854	0.1962569
6	53 47 9.3	1 36 19.9	− 2 5.1	− 1 15 51.2	+ 5 17.9	9.8586031	0.1984594	

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GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 2	47 22 3.7	1 36 13.0	− 2 31.0	− 1 36 30.8	+ 5 1.2	9.8589279	0.1939854	0.1962569
6	53 47 9.3	1 36 19.9	2 5.1	1 15 51.2	5 17.9	9 8586031	0.1984594	0.2005938
10	60 12 42.8	1 36 26.9	1 32.9	0 54 12.6	5 30.7	9.8582872	0.2026606	0.2046612
14	66 38 44.7	1 36 34.0	0 55.9	0 31 51.2	5 39.3	9.8579839	0.2065967	0.2084676
18	73 5 15.3	1 36 41.2	− 0 16.1	− 0 9 3.7	5 43.6	9.8576973	0.2102747	0.2120186
22	79 32 14.7	1 36 48.4	+ 0 24.6	+ 0 13 52.3	+ 5 43.6	9.8574310	0.2136994	0.2153174
26	85 59 42.6	1 36 55.5	1 4.1	0 36 39.3	5 39.2	9.8571886	0.2168721	0.2183636
30	92 27 38.3	1 37 2.3	1 40.4	0 58 59.8	5 30.4	9.8569732	0.2197917	0.2211564
Aug. 3	98 56 0.7	1 37 8.8	2 11.6	1 20 36.5	5 17.3	9.8567876	0.2224578	0.2236965
7	105 24 48.0	1 37 14.7	2 36.1	1 41 12.5	5 0.0	9.8566342	0.2248731	0.2259884
11	111 53 57.8	1 37 20.0	+ 2 52.7	+ 2 0 31.8	+ 4 38.8	9.8565151	0.2270433	0.2280392
15	118 23 27.3	1 37 24.5	3 0.5	2 18 18.5	4 14.0	9.8564319	0.2289767	0.2298567
19	124 53 13.1	1 37 28.1	2 59.0	2 34 19.5	3 45.9	9.8563856	0.2306796	0.2314459
23	131 23 11.1	1 37 30.6	2 48.3	2 48 21.8	3 14.8	9.8563768	0.2321557	0.2328087
27	137 53 16.5	1 37 31.8	2 29.1	3 0 14.4	2 41.1	9.8564058	0.2334054	0.2339453
31	144 23 24.4	1 37 31.8	+ 2 2.3	+ 3 9 47.9	+ 2 5.4	9.8564721	0.2344284	0.2348553
Sept. 4	150 53 29.5	1 37 30.5	1 29.1	3 16 55.1	1 28.0	9.8565747	0.2352261	0.2355417
8	157 23 26.3	1 37 27.7	0 51.3	3 21 30.5	0 49.5	9.8567124	0.2358029	0.2360108
12	163 53 9.0	1 37 23.5	+ 0 11.0	3 23 30.8	+ 0 10.5	9.8568832	0.2361662	0.2362701
16	170 22 32.1	1 37 17.9	− 0 29.8	3 22 54.9	− 0 28.5	9.8570850	0.2363234	0.2363271
20	176 51 30.4	1 37 11.1	− 1 9.0	+ 3 19 43.5	− 1 7.1	9.8573149	0.2362806	0.2361847
24	183 19 59.2	1 37 3.2	1 44.8	3 13 59.7	1 44 6	9.8575702	0.2360397	0.2358448
28	189 47 54.1	1 36 54.2	2 15.1	3 5 48.5	2 20.7	9.8578474	0.2356001	0.2353060
Oct. 2	196 15 11.4	1 36 44.2	2 38 6	2 55 16.8	2 54.8	9.8581430	0.2349620	0.2345687
6	202 41 48.2	1 36 34.0	2 54.0	2 42 33.2	3 26.6	9.8584532	0.2341269	0.2336373
10	209 7 42.7	1 36 23.2	− 3 0.7	+ 2 27 47.9	− 3 55.6	9.8587740	0.2331007	0.2325180
14	215 32 53.6	1 36 12.2	2 58.4	2 11 12.7	4 21.5	9.8591013	0.2318900	0.2312175
18	221 57 20.5	1 36 1.3	2 47.1	1 53 0.6	4 43.9	9.8594310	0.2305007	0.2297401
22	228 21 4.2	1 35 50.6	2 27.5	1 33 25.8	5 2.8	9.8597591	0.2289358	0.2280871
26	234 44 6.1	1 35 40.4	2 0.7	1 12 43.2	5 17.8	9.8600814	0.2271937	0.2262558
30	241 6 28.6	1 35 30 9	− 1 28.0	+ 0 51 8.4	− 5 28.9	9.8603941	0.2252730	0.2242448
Nov. 3	247 28 14.4	1 35 22.2	0 51.0	0 28 57.6	5 35.8	9.8606931	0.2231716	0.2220538
7	253 49 27.0	1 35 14.4	− 0 11.5	+ 0 6 27.3	5 38.6	9.8609749	0.2208914	0.2196854
11	260 10 10.4	1 35 7.6	+ 0 28.5	− 0 16 6.1	5 37.4	9.8612361	0.2184361	0.2171444
15	266 30 29.0	1 35 1.9	1 7.1	0 38 26.2	5 32.0	9.8614736	0.2158105	0.2144345
19	272 50 27.4	1 34 57.4	+ 1 42.3	− 1 0 16.7	− 5 22.6	9.8616845	0.2130162	0.2115554
23	279 10 10.1	1 34 54.1	2 12.5	1 21 22.0	5 9.4	9.8618662	0.2100514	0.2085040
27	285 29 41.7	1 34 51.9	2 36.3	1 41 26.9	4 52.4	9.8620168	0.2069120	0.2052746
Dec. 1	291 49 6.8	1 34 50.8	2 52.5	2 0 17.0	4 32.0	9.8621343	0.2035912	0.2018617
5	298 8 29.8	1 34 50.8	3 0.3	2 17 38.9	4 8.4	9.8622174	0.2000859	0.1982640
9	304 27 54.7	1 34 51.8	+ 2 59.4	− 2 33 20.2	− 3 41.7	9.8622651	0.1963958	0.1944815
13	310 47 25.2	1 34 53.6	2 49.7	2 47 9.4	3 12.4	9.8622769	0.1925208	0.1905145
17	317 7 4.6	1 34 56.2	2 31.8	2 58 56.7	2 40.8	9.8622525	0.1884623	0.1863631
21	323 26 55.8	1 34 59.5	2 6.5	3 8 33.5	2 7.3	9.8621924	0.1842162	0.1820203
25	329 47 1.3	1 35 3.4	1 35.0	3 15 52.7	1 32.1	9.8620971	0.1797741	0.1774769
29	336 7 23.2	1 35 7.7	+ 0 58.9	− 3 20 48.8	− 0 55.8	9.8619678	0.1751268	0.1727228
33	342 28 3.3	1 35 12.4	+ 0 20.0	− 3 23 17.9	− 0 18.0	9.8618060	0.1702640	

MARS.

GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 3	272 15 44.3	34 45.14	+ 53.9	− 1 16 36.1	− 48.75	0.1602134	0.3836972	0.3829852
7	274 35 11.6	34 58.40	53.9	1 19 47 8	47.09	0.1588480	0.3822568	0.3815123
11	276 55 31.4	35 11.44	53.5	1 22 52.8	45.34	0.1575111	0.3807522	0.3799772
15	279 16 42.8	35 24.26	52.8	1 25 50.6	43.48	0.1562055	0.3791882	0.3783862
19	281 38 45.1	35 36.83	51.8	1 28 40.7	41.50	0.1549339	0.3775720	0.3767465
23	284 1 37.1	35 49.10	+ 50.4	− 1 31 22.6	− 39.40	0.1536990	0.3759102	0 3750636
27	286 25 17.5	36 1.02	48.6	1 33 55.9	37.19	0.1525037	0.3742071	0.3733408
31	288 49 44.8	36 12.60	46.5	1 36 20.1	34.86	0.1513506	0.3724646	0.3715786
Feb. 4	291 14 57.8	36 23.82	44.1	1 38 34.8	32.42	0.1502421	0.3706828	0.3697772
8	293 40 54.8	36 34.62	41.3	1 40 39.5	29.88	0.1491608	0.3688623	0.3679386
12	296 7 34.0	36 44.94	+ 38.2	− 1 42 33.8	− 27.24	0.1481693	0.3670068	0.3660676
16	298 34 53.6	36 54.76	34.7	1 44 17.4	24.51	0.1472102	0.3651218	0.3641699
20	301 2 51.4	37 4.06	31.0	1 45 49.9	21.70	0.1463058	0.3632129	0.3622511
24	303 31 25.3	37 12.80	27.1	1 47 11.0	18.80	0.1454583	0.3612847	0.3603137
28	306 0 33.0	37 20.96	23.0	1 48 20.4	15.82	0.1446698	0.3593379	0.3583570
Mar. 4	308 30 12.2	37 28.52	+ 18.7	− 1 49 17.6	− 12.76	0.1439425	0.3573711	0.3563800
8	311 0 20.4	37 35.44	14.3	1 50 2.5	9.65	0.1432783	0.3553836	0.3543821
12	313 30 55.0	37 41.71	9.7	1 50 34.9	6.51	0.1426787	0 3533758	0.3523653
16	316 1 53.2	37 47.30	5.0	1 50 54.6	3.34	0.1421455	0.3513511	0.3503339
20	318 33 12.4	37 52.17	+ 0.2	1 51 1.6	− 0.14	0.1416801	0.3493139	0.3482915
24	321 4 49.6	37 56.31	− 4.5	− 1 50 55.7	+ 3.11	0.1412837	0.3472667	0.3462392
28	323 36 41.9	37 59.70	9.3	1 50 36.7	6.37	0.1409574	0.3452089	0.3441753
Apr. 1	326 8 46.2	38 2.35	13.9	1 50 4.7	9.61	0.1407023	0.3431379	0.3420960
5	328 40 59.7	38 4.26	18.5	1 49 19.8	12.84	0.1405190	0.3410493	0.3399975
9	331 13 19.3	38 5.41	22.9	1 48 22.0	16.05	0.1404080	0.3389406	0.3378788
13	333 45 42.0	38 5.77	− 27.1	− 1 47 11.4	+ 19.22	0.1403693	0.3368123	0.3357414
17	336 18 4.5	38 5.34	31.1	1 45 48.2	22.36	0.1404034	0.3346664	0.3335871
21	338 50 23.7	38 4.15	34.9	1 44 12.5	25.44	0.1405102	0.3325034	0.3314151
25	341 22 36.7	38 2.20	38.3	1 42 24.7	28.44	0.1406893	0.3303216	0.3292220
29	343 54 40.3	37 59.50	41.5	1 40 25.0	31.38	0.1409402	0.3281154	0.3270010
May 3	346 26 31.6	37 56.05	− 44.4	− 1 38 13.7	+ 34 24	0.1412622	0.3258780	0.3247460
7	348 58 7.7	37 51.84	47.0	1 35 51.1	37.01	0.1416543	0.3236043	0.3224524
11	351 29 25.4	37 46.91	49.2	1 33 17.6	39.67	0.1421155	0.3212903	0.3201181
15	354 0 22.0	37 41.29	50.9	1 30 33.7	42.22	0.1426445	0.3189359	0.3177436
19	356 30 54.8	37 35.01	52.2	1 27 39.8	44.66	0.1432400	0.3165407	0.3153266
23	359 1 1.2	37 28 09	− 53.2	− 1 24 36.4	+ 46.99	0.1439005	0.3141004	0.3128613
27	1 30 38.6	37 20.51	53.8	1 21 23.9	49.19	0.1446240	0.3116083	0.3103400
31	3 59 44.4	37 12.29	53.9	1 18 2.9	51.25	0.1454086	0.3090552	0.3077529
June 4	6 28 16.1	37 3.51	53.6	1 14 33.9	53.19	0.1462525	0.3064325	0.3050933
8	8 56 11.7	36 54.24	53.0	1 10 57.4	54.99	0.1471535	0.3037346	0.3023563
12	11 23 29.3	36 44.46	− 51.9	− 1 7 14.0	+ 56.64	0.1481090	0.3009581	0.2995399
16	13 50 6.7	36 34.16	50.5	1 3 24.3	58.14	0.1491172	0.2981010	0.2966407
20	16 16 1.9	36 23.38	48.8	0 59 28.9	59.50	0.1501752	0.2951583	0.2936525
24	18 41 13.2	36 12.19	46.7	0 55 28.3	60.75	0.1512806	0.2921221	0.2905658
28	21 5 38.9	36 0.64	44.2	0 51 22.9	61.86	0.1524308	0.2889820	0.2873693
July 2	23 29 17.8	35 48.76	− 41.5	− 0 47 13.4	+ 62.81	0.1536233	0.2857265	0.2840527
6	25 52 8.6	35 36.54	− 38.6	− 0 43 0.4	+ 63.61	0.1548553	0.2823472	

MARS.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 2	23 29 17.8	35 48.76	− 41.5	− 0 47 13.4	+ 62.81	0.1536233	0.2857265	0.2840527
6	25 52 8.6	35 36.54	38.6	0 43 0.4	63.61	0.1548553	0.2823472	0.2806095
10	28 14 9.6	35 24.04	35.3	0 38 44.5	64.28	0.1561243	0.2788392	0.2770358
14	30 35 20.3	35 11.29	31.8	0 34 26.2	64.82	0.1574274	0.2751988	0.2733275
18	32 55 39.5	34 58.29	28.2	0 30 5.9	65.23	0.1587621	0.2714209	0.2694776
22	35 15 6.3	34 45.09	− 24.4	− 0 25 44.3	+ 65.50	0.1601255	0.2674962	0.2654754
26	37 33 40.0	34 31.73	20.4	0 21 21.9	65.65	0.1615147	0.2634132	0.2613079
30	39 51 20.0	34 18.26	16.3	0 16 59.1	65.69	0.1629270	0.2591581	0.2569628
Aug. 3	42 8 6.0	34 4.72	12.2	0 12 36.4	65.61	0.1643600	0.2547210	0.2524317
7	44 23 57.7	33 51.07	8.0	0 8 14.2	65.42	0.1658111	0.2500943	0.2477083
11	46 38 54.6	33 37.39	− 3.8	− 0 3 53.0	+ 65.12	0.1672776	0.2452729	0.2427875
15	48 52 56.8	33 23.70	+ 0.4	+ 0 0 26.8	64.72	0.1687569	0.2402513	0.2376628
19	51 6 4.2	33 10.02	4.6	0 4 44.8	64.21	0.1702466	0.2350204	0.2323220
23	53 18 17.0	32 56.36	8.7	0 9 0.5	63.61	0.1717443	0.2295659	0.2267503
27	55 29 35.2	32 42.72	12.7	0 13 13.7	62.93	0 1732475	0.2238734	0.2209335
31	57 39 59.0	32 29.16	+ 16.6	+ 0 17 24.0	+ 62.17	0.1747539	0.2179296	0.2148606
Sept. 4	59 49 28.6	32 15.69	20.5	0 21 31.1	61.33	0.1762613	0.2117255	0.2085238
8	61 58 4.7	32 2.36	24.2	0 25 34.7	60.42	0.1777674	0.2052548	0.2019176
12	64 5 47.8	31 49.17	27.7	0 29 34.5	59.44	0.1792701	0.1985110	0.1950337
16	66 12 38.3	31 36.11	31.0	0 33 30.2	58.39	0.1807674	0.1914840	0.1878603
20	68 18 36.9	31 23.18	+ 34.1	+ 0 37 21.6	+ 57.28	0.1822574	0.1841605	0.1803821
24	70 23 44.0	31 10.42	37.1	0 41 8.4	56.11	0.1837381	0.1765231	0.1725818
28	72 28 0.5	30 57.85	39.8	0 44 50.5	54.89	0.1852076	0.1685567	0.1644467
Oct. 2	74 31 27.1	30 45.49	42.3	0 48 27.6	53.62	0.1866642	0.1602509	0.1559686
6	76 34 4.7	30 33.36	44.6	0 51 59.5	52.31	0.1881063	0.1515994	0.1471424
10	78 35 54.2	30 21.45	+ 46.7	+ 0 55 26.1	+ 50.98	0.1895322	0.1425968	0.1379613
14	80 36 56.6	30 9.75	48.4	0 58 47.3	49.59	0.1909402	0.1332346	0.1284150
18	82 37 12.5	29 58.26	49.9	1 2 2.8	48.16	0.1923290	0.1235004	0.1184889
22	84 36 42.9	29 47.00	51.2	1 5 12.6	46.70	0.1936972	0.1133787	0.1081685
26	86 35 28.8	29 36.01	52.3	1 8 16.5	45.22	0.1950434	0.1028569	0.0974431
30	88 33 31.3	29 25.29	+ 53.1	+ 1 11 14.4	+ 43.72	0.1963662	0.0919272	0.0863098
Nov. 3	90 30 51.5	29 14.85	53.6	1 14 6.3	42.20	0.1976643	0.0805915	0.0747728
7	92 27 30.5	29 4.67	53.9	1 16 52.1	40.66	0.1989368	0.0688542	0.0628364
11	94 23 29.3	28 54.75	53.9	1 19 31.6	39.09	0.2001825	0.0567197	0.0505046
15	96 18 48.9	28 45.11	53.6	1 22 4.8	37.50	0.2014004	0.0441913	0.0377800
19	98 13 30.6	28 35.76	+ 53.2	+ 1 24 31.6	+ 35.91	0.2025893	0.0312716	0.0246677
23	100 7 35.4	28 26.69	52.6	1 26 52.1	34.32	0.2037484	0.0179710	0.0111853
27	102 1 4.5	28 17.89	51.6	1 29 6.2	32.71	0.2048768	0.0043150	9.9973661
Dec. 1	103 53 58.9	28 9.39	50.5	1 31 13.8	31.09	0.2059737	9.9903455	9.9832607
5	105 46 19.9	28 1.19	49.2	1 33 14.9	29 47	0.2070382	9.9761198	9.9689317
9	107 38 8.8	27 53.99	+ 47.6	+ 1 35 9.5	+ 27.84	0.2080696	9.9617056	9.9544517
13	109 29 26.6	27 45 67	45.9	1 36 57.6	26.20	0.2090671	9 9471810	9.9399057
17	111 20 14.5	27 38.34	44.0	1 38 39.1	24.56	0.2100302	9.9326390	9.9253968
21	113 10 33.7	27 31.31	41.9	1 40 14.1	22.92	0.2109582	9.9181976	9.9110619
25	115 0 25.4	27 24.59	39.6	1 41 42.5	21.29	0.2118504	9.9040125	9.8970746
29	116 49 50.8	27 18.15	+ 37.2	+ 1 43 4.4	+ 19.66	0.2127064	9.8902755	9.8836439
33	118 38 51.0	27 11.99	+ 34.6	+ 1 44 19.8	+ 18.04	0.2135255	9.8772101	

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 3	87 43 40.1	5 8.06	− 10.6	−0 15 40.0	+ 6.90	0.7096278	0.6214630	0.6226561
7	88 4 11.9	5 7.87	10.3	0 15 12.3	6.91	0.7097491	0.6239680	0.6253944
11	88 24 43.0	5 7.69	10.0	0 14 44.7	6.91	0.7098707	0.6269323	0.6285771
15	88 45 13.5	5 7.52	9.7	0 14 17.1	6.92	0.7099925	0.6303245	0.6321698
19	89 5 43.2	5 7.35	9.4	0 13 49.4	6.92	0.7101144	0.6341083	0.6361354
23	89 26 12.3	5 7.18	− 9.1	−0 13 21.7	+ 6.92	0.7102364	0.6382465	0.6404371
27	89 46 40.6	5 7.00	8.8	0 12 54.0	6.93	0.7103585	0.6427026	0.6450383
31	90 7 8.3	5 6.83	8.5	0 12 26.3	6.93	0.7104807	0.6474397	0.6499021
Feb. 4	90 27 35.3	5 6.66	8.2	0 11 58.6	6.93	0.7106030	0.6524208	0.6549909
8	90 48 1.6	5 6.49	7.8	0 11 30.9	6.93	0.7107254	0.6576076	0.6602663
12	91 8 27.1	5 6.31	− 7.5	−0 11 3.1	+ 6.93	0.7108479	0.6629617	0.6656895
16	91 28 52.0	5 6.14	7.2	0 10 35.4	6.94	0.7109705	0.6684446	0.6712234
20	91 49 16.2	5 5.96	6.9	0 10 7.6	6.94	0.7110932	0.6740211	0.6768344
24	92 9 39.7	5 5.79	6.6	0 9 39.9	6.94	0.7112160	0.6796592	0.6824927
28	92 30 2.6	5 5.62	6.3	0 9 12.1	6.94	0.7113389	0.6853303	0.6881702
Mar. 4	92 50 24.7	5 5.44	− 6.0	−0 8 44.4	+ 6.94	0.7114619	0.6910082	0.6938413
8	93 10 46.1	5 5.27	5.7	0 8 16.6	6.94	0.7115848	0.6966659	0.6994792
12	93 31 6.8	5 5.09	5.3	0 7 48.8	6.94	0.7117080	0.7022781	0.7050602
16	93 51 26.8	5 4.92	5.0	0 7 21.1	6.94	0.7118312	0.7078219	0.7105614
20	94 11 46.1	5 4.74	4.7	0 6 53.3	6.94	0.7119545	0.7132762	0.7159647
24	94 32 4.8	5 4.57	− 4.4	−0 6 25.5	+ 6.94	0.7120778	0.7186248	0.7212550
28	94 52 22.7	5 4.40	4.0	0 5 57.8	6.94	0.7122014	0.7238536	0.7264190
Apr. 1	95 12 39.9	5 4.22	3.7	0 5 30.0	6.94	0.7123250	0.7289494	0.7314433
5	95 32 56.5	5 4.05	3.4	0 5 2.3	6.94	0.7124488	0.7338992	0.7363158
9	95 53 12.3	5 3.98	3.1	0 4 34.5	6.94	0.7125726	0.7386910	0.7410239
13	96 13 27.5	5 3.80	− 2.8	−0 4 6.8	+ 6.94	0.7126965	0.7433129	0.7455574
17	96 33 42.0	5 3.63	2.5	0 3 39.0	6.93	0.7128205	0.7477562	0.7499086
21	96 53 55.7	5 3.46	2.2	0 3 11.3	6.93	0.7129445	0.7520144	0.7540723
25	97 14 8.8	5 3.18	1.9	0 2 43.6	6.98	0.7130686	0.7560825	0.7580440
29	97 34 21.2	5 3.01	1.5	0 2 15.9	6.93	0.7131928	0.7599562	0.7618185
May 3	97 54 32.9	5 2.83	− 1.2	−0 1 48.2	+ 6.92	0.7133170	0.7636300	0.7653901
7	98 14 43.9	5 2.66	0.9	0 1 20.5	6.92	0.7134412	0.7670981	0.7687536
11	98 34 54.2	5 2.49	0.6	0 0 52.8	6.92	0.7135653	0.7703560	0.7719052
15	98 55 3.8	5 2.31	− 0.3	−0 0 25.2	6.91	0.7136895	0.7734005	0.7748419
19	99 15 12.7	5 2.14	0.0	+0 0 2.4	6.91	0.7138137	0.7762294	0.7775631
23	99 35 20.9	5 1.96	+ 0.3	+0 0 30.1	+ 6.91	0.7139380	0.7788428	0.7800684
27	99 55 28.4	5 1.79	0.6	0 0 57.7	6.90	0.7140622	0.7812396	0.7823561
31	100 15 35.3	5 1.62	1.0	0 1 25.3	6.90	0.7141864	0.7834177	0.7844237
June 4	100 35 41.4	5 1.45	1.3	0 1 52.8	6.89	0.7143106	0.7853742	0.7862690
8	100 55 46.9	5 1.27	1.6	0 2 20.4	6.89	0.7144348	0.7871076	0.7878898
12	101 15 51.7	5 1.10	+ 1.9	+0 2 47.9	+ 6.88	0.7145589	0.7886160	0.7892866
16	101 35 55.7	5 0.93	2.3	0 3 15.4	6.88	0.7146830	0.7899016	0.7904600
20	101 55 59.1	5 0.76	2.6	0 3 42.9	6.87	0.7148071	0.7909628	0.7914100
24	102 16 1.8	5 0.59	2.9	0 4 10.4	6.86	0.7149312	0.7918015	0.7921373
28	102 36 3.9	5 0.42	3.2	0 4 37.8	6.86	0.7150552	0.7924170	0.7926406
July 2	102 56 5.2	5 0.25	+ 3.5	+0 5 5.2	+ 6.85	0.7151792	0.7928076	0.7929180
6	103 16 5.8	5 0.08	+ 3.8	+0 5 32.6	+ 6.84	0.7153031	0.7929718	

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 2	102 56 5.2	5 0.25	+ 3.5	+ 0 5 5.2	+ 6.85	0.7151792	0.7928076	0.7929180
6	103 16 5.8	5 0.08	3.8	0 5 32.6	6.84	0.7153031	0.7929718	0.7929691
10	103 36 5.8	4 59.91	4.1	0 6 0.0	6.84	0.7154270	0.7929099	0.7927944
14	103 56 5.1	4 59.74	4.4	0 6 27.3	6.83	0.7155509	0.7926227	0.7923950
18	104 16 3.7	4 59.56	4.8	0 6 54.6	6.83	0.7156747	0.7921117	0.7917730
22	104 36 1.6	4 59.39	+ 5.1	+ 0 7 21.9	+ 6.82	0.7157985	0.7913789	0.7909288
26	104 55 58.8	4 59.22	5.4	0 7 49.2	6.81	0.7159222	0.7904228	0.7898613
30	105 15 55.4	4 59.05	5.7	0 8 16.4	6.80	0.7160459	0.7892439	0.7885703
Aug. 3	105 35 51.2	4 58.88	6.0	0 8 43.6	6.79	0.7161695	0.7878408	0.7870558
7	105 55 46.4	4 58.71	6.3	0 9 10.7	6.79	0.7162931	0.7862150	0.7853188
11	106 15 40.9	4 58.54	+ 6.6	+ 0 9 37.8	+ 6.78	0.7164166	0.7843678	0.7833623
15	106 35 34.7	4 58.37	6.9	0 10 4.9	6.77	0.7165400	0.7823025	0.7811886
19	106 55 27.8	4 58.20	7.2	0 10 32.0	6.76	0.7166633	0.7800211	0.7787998
23	107 15 20.3	4 58.03	7.5	0 10 59.0	6.75	0.7167865	0.7775251	0.7761972
27	107 35 12.1	4 57.86	7.8	0 11 25.9	6.74	0.7169096	0.7748155	0.7733804
31	107 55 3.2	4 57.69	+ 8.1	+ 0 11 52.9	+ 6.73	0.7170327	0.7718926	0.7703525
Sept. 4	108 14 53.6	4 57.52	8.4	0 12 20.0	6.72	0.7171557	0.7687607	0.7671175
8	108 34 43.4	4 57.35	8.7	0 12 46.6	6.71	0.7172786	0.7654237	0.7636800
12	108 54 32.4	4 57.19	9.0	0 13 13.4	6.70	0.7174014	0.7618873	0.7600462
16	109 14 20.8	4 57.02	9.3	0 13 40.2	6.69	0.7175240	0.7581574	0.7562215
20	109 34 8.6	4 56.85	+ 9.6	+ 0 14 6.9	+ 6.68	0.7176465	0.7542388	0.7522103
24	109 53 55.6	4 56.68	9.9	0 14 33.6	6.67	0.7177688	0.7501363	0.7480179
28	110 13 42.0	4 56.51	10.2	0 15 0.2	6.66	0.7178909	0.7458560	0.7436519
Oct. 2	110 33 27.7	4 56.34	10.4	0 15 26.8	6.64	0.7180129	0.7414067	0.7391220
6	110 53 12.7	4 56.17	10.7	0 15 53.3	6.63	0.7181347	0.7367990	0.7344396
10	111 12 57.1	4 56.00	+ 11.0	+ 0 16 19.8	+ 6.62	0.7182563	0.7320452	0.7296176
14	111 32 40.8	4 55.84	11.3	0 16 46.3	6.61	0.7183778	0.7271586	0.7246700
18	111 52 23.8	4 55.68	11.6	0 17 12.7	6.60	0.7184992	0.7221530	0.7196097
22	112 12 6.3	4 55.52	11.9	0 17 39.0	6.58	0.7186204	0.7170414	0.7144506
26	112 31 48.1	4 55.35	12.2	0 18 5.3	6.57	0.7187414	0.7118395	0.7092109
30	112 51 29.2	4 55.19	+ 12.5	+ 0 18 31.6	+ 6.56	0.7188623	0.7065673	0.7039118
Nov. 3	113 11 9.6	4 55.03	12.7	0 18 57.8	6.55	0.7189830	0.7012473	0.6985771
7	113 30 49.4	4 54.87	13.0	0 19 23.9	6.54	0.7191036	0.6959044	0.6932325
11	113 50 28.6	4 54.71	13.3	0 19 50.0	6.52	0.7192240	0.6905645	0.6879041
15	114 10 7.1	4 54.54	13.6	0 20 16.1	6.51	0.7193443	0.6852542	0.6826188
19	114 29 45.0	4 54.38	+ 13.8	+ 0 20 42.1	+ 6.49	0.7194645	0.6800009	0.6774050
23	114 49 22.2	4 54.21	14.1	0 21 8.0	6.48	0.7195844	0.6748347	0.6722946
27	115 8 58.7	4 54.05	14.4	0 21 33.9	6.47	0.7197042	0.6697893	0.6673233
Dec. 1	115 28 34.6	4 53.89	14.7	0 21 59.7	6.45	0.7198238	0.6649016	0.6625288
5	115 48 10.0	4 53.72	14.9	0 22 25.5	6.44	0.7199433	0.6602094	0.6579479
9	116 7 44.5	4 53.56	+ 15.2	+ 0 22 51.2	+ 6.42	0.7200626	0.6557497	0.6536190
13	116 27 18.4	4 53.40	15.5	0 23 16.9	6.41	0.7201817	0.6515598	0.6495765
17	116 46 51.7	4 53.24	15.7	0 23 42.4	6.39	0.7203006	0.6476735	0.6458552
21	117 6 24.3	4 53.08	15.9	0 24 8.0	6.37	0.7204194	0.6441264	0.6424913
25	117 25 56.3	4 52.92	16.2	0 24 33.4	6.36	0.7205379	0.6409545	0.6395201
29	117 45 27.7	4 52.76	+ 16.4	+ 0 24 58.8	+ 6.35	0.7206563	0.6381919	0.6369739
33	118 4 58.4	4 52.60	+ 16.6	+ 0 25 24.2	+ 6.33	0.7207744	0.6358700	

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
Jan. 3	54 29 32.1	2 11.91	− 1 27.2	− 2 6 57.9	+ 3.01	0.9603038	0.9296872	0.9310629
7	54 38 19.9	2 11.93	1 27.4	2 6 45.8	3.03	0.9602679	0.9324697	0.9339051
11	54 47 7.6	2 11.95	1 27.6	2 6 33.6	3.04	0.9602326	0.9353666	0.9368518
15	54 55 55.4	2 11.96	1 27.8	2 6 21.5	3.05	0.9601974	0.9383583	0.9398838
19	55 4 43.3	2 11.98	1 28.0	2 6 9.3	3.06	0.9601623	0.9414258	0.9429822
23	55 13 31.4	2 12.01	− 1 28.2	− 2 5 56.9	+ 3.08	0.9601273	0.9445509	0.9461297
27	55 22 19.5	2 12.03	1 28.4	2 5 44.5	3.09	0.9600924	0.9477168	0.9493101
31	55 31 7.6	2 12.04	1 28.6	2 5 32.1	3.10	0.9600575	0.9509077	0.9525074
Feb. 4	55 39 55.8	2 12.06	1 28.8	2 5 19.7	3.11	0.9600228	0.9541073	0.9557057
8	55 48 44.1	2 12.08	1 29.0	2 5 7.3	3.12	0.9599881	0.9573002	0.9588888
12	55 57 32.6	2 12.11	− 1 29.2	− 2 4 54.6	+ 3.13	0.9599535	0.9604699	0.9620415
16	56 6 21.0	2 12.13	1 29.4	2 4 41.9	3.15	0.9599191	0.9636021	0.9651497
20	56 15 9.6	2 12.15	1 29.6	2 4 29.3	3.16	0.9598849	0.9666832	0.9682010
24	56 23 58.2	2 12.17	1 29.8	2 4 16.6	3.17	0.9598506	0.9697018	0.9711844
28	56 32 46.9	2 12.19	1 30.1	2 4 4.0	3.19	0.9598164	0.9726474	0.9740897
Mar. 4	56 41 35.8	2 12.22	− 1 30.3	− 2 3 51.1	+ 3.20	0.9597824	0.9755098	0.9769063
8	56 50 24.6	2 12.24	1 30.5	2 3 38.1	3.21	0.9597485	0.9782783	0.9796242
12	56 59 13.6	2 12.25	1 30.6	2 3 25.2	3.23	0.9597147	0.9809431	0.9822337
16	57 8 2.6	2 12.27	1 30.8	2 3 12.3	3.24	0.9596810	0.9834953	0.9847269
20	57 16 51.7	2 12.29	1 31.0	2 2 59.4	3.25	0.9596474	0.9859278	0.9870972
24	57 25 40.9	2 12.31	− 1 31.1	− 2 2 46.2	+ 3.27	0.9596139	0.9882343	0.9893387
28	57 34 30.1	2 12.33	1 31.3	2 2 33.1	3.28	0.9595805	0.9904095	0.9914462
Apr. 1	57 43 19.4	2 12.35	1 31.5	2 2 19.9	3.29	0.9595473	0.9924482	0.9934149
5	57 52 8.8	2 12.37	1 31.7	2 2 6.7	3.30	0.9595140	0.9943454	0.9952389
9	58 0 58.3	2 12.39	1 31.9	2 1 53.5	3.32	0.9594809	0.9960950	0.9969134
13	58 9 47.9	2 12.40	− 1 32.1	− 2 1 40.1	+ 3.33	0.9594481	0.9976936	0.9984350
17	58 18 37.5	2 12.42	1 32.2	2 1 26.7	3.34	0.9594152	0.9991374	0.9998008
21	58 27 27.2	2 12.44	1 32.4	2 1 13.3	3.35	0.9593824	1.0004247	1.0010092
25	58 36 17.0	2 12.46	1 32.5	2 0 59.9	3.36	0.9593497	1.0015542	1.0020591
29	58 45 6.8	2 12.48	1 32.7	2 0 46.4	3.37	0.9593170	1.0025237	1.0029478
May 3	58 53 56.7	2 12.50	− 1 32.8	− 2 0 32.7	+ 3.39	0.9592845	1.0033311	1.0036732
7	59 2 46.7	2 12.52	1 33.0	2 0 19.1	3.41	0.9592522	1.0039741	1.0042336
11	59 11 36.8	2 12.54	1 33.1	2 0 5.4	3.42	0.5992199	1.0044516	1.0046280
15	59 20 27.0	2 12.56	1 33.3	1 59 51.8	3.43	0.9591878	1.0047631	1.0048570
19	59 29 17.2	2 12.58	1 33.4	1 59 38.0	3.44	0.9591557	1.0049096	1.0049210
23	59 38 7.5	2 12.60	− 1 33.6	− 1 59 24.1	+ 3.46	0.9591238	1.0048914	1.0048208
27	59 46 57.9	2 12.62	1 33.7	1 59 10.2	3.47	0.9590921	1.0047092	1.0045567
31	59 55 48.4	2 12.63	1 33.8	1 58 56.3	3.48	0.9590604	1.0043631	1.0041283
June 4	60 4 38.9	2 12.64	1 33.9	1 58 42.3	3.49	0.9590288	1.0038527	1.0035361
8	60 13 29.4	2 12.65	1 34.0	1 58 28.4	3.50	0.9589974	1.0031788	1.0027813
12	60 22 20.1	2 12.67	− 1 34.2	− 1 58 14.3	+ 3.52	0.9589660	1.0023437	1.0018664
16	60 31 10.8	2 12.70	1 34.3	1 58 0.1	3 53	0.9589349	1.0013497	1.0007940
20	60 40 1.7	2 12.72	1 34.5	1 57 46.0	3.54	0.9589038	1.0001997	0.9995669
24	60 48 52.6	2 12.72	1 34.6	1 57 31.8	3.55	0.9588729	0.9988959	0.9981869
28	60 57 43.5	2 12.73	1 34.7	1 57 17.6	3.56	0.9588421	0.9974407	0.9966569
July 2	61 6 34.5	2 12.76	− 1 34.8	− 1 57 3.2	+ 3.57	0.9588115	0.9958360	0.9949784
6	61 15 25.7	2 12.79	− 1 34.9	− 1 56 48.7	+ 3.58	0.9587810	0.9940848	

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
July 2	61 6 34.5	2 12.78	− 1 34.8	− 1 57 3.2	+ 3.57	0.9588115	0.9958360	0.9949784
6	61 15 25.7	2 12.79	1 34.9	1 56 48.7	3.58	0 9587810	0.9940848	0.9931557
10	61 24 16.9	2 12.80	1 35.0	1 56 34.4	3.60	0.9587506	0.9921918	0.9911935
14	61 33 8.1	2 12.81	1 35.1	1 56 20.0	3.61	0.9587203	0.9901617	0.9890970
18	61 41 59.4	2 12.83	1 35.2	1 56 5.6	3.62	0.9586901	0.9880003	0.9868719
22	61 50 50.8	2 12.84	− 1 35.3	− 1 55 50.9	+ 3.63	0.9586601	0.9857125	0.9845225
26	61 59 42.2	2 12.86	1 35.4	1 55 36.3	3.65	0.9586303	0.9833028	0.9820540
30	62 8 33.8	2 12.88	1 35.5	1 55 21.6	3.66	0.9586005	0.9807770	0.9794725
Aug. 3	62 17 25.3	2 12.90	1 35.6	1 55 6.9	3.67	0.9585708	0.9781416	0.9767850
7	62 26 17.0	2 12.92	1 35.7	1 54 52.3	3.68	0.9585413	0.9754041	0.9739999
11	62 35 8.8	2 12.94	− 1 35.8	− 1 54 37.4	+ 3.69	0.9585120	0.9725737	0.9711266
15	62 44 0.5	2 12.95	1 35.9	1 54 22.5	3.70	0.9584827	0.9696598	0.9681743
19	62 52 52.4	2 12.97	1 36.0	1 54 7.6	3.72	0.9584536	0.9666714	0.9651522
23	63 1 44.3	2 12.98	1 36.0	1 53 52.8	3.73	0.9584246	0.9636179	0.9620697
27	63 10 36.3	2 13.00	1 36.1	1 53 37.9	3.73	0.9583957	0.9605091	0.9589376
31	63 19 28.4	2 13.02	− 1 36.2	− 1 53 22.7	+ 3.74	0.9583670	0.9573568	0.9557682
Sept. 4	63 28 20.5	2 13.03	1 36.2	1 53 7.6	3.76	0.9583383	0.9541739	0.9525753
8	63 37 12.7	2 13.05	1 36.3	1 52 52.6	3.77	0.9583098	0.9509744	0.9493730
12	63 46 4.9	2 13.07	1 36.4	1 52 37.4	3.77	0.9582815	0.9477730	0.9461760
16	63 54 57.2	2 13.08	1 36.5	1 52 22.3	3.79	0.9582533	0.9445840	0.9429985
20	64 3 49.6	2 13.10	− 1 36.5	− 1 52 7.0	+ 3.80	0.9582252	0.9414213	0.9398546
24	64 12 42.0	2 13.11	1 36.6	1 51 51.6	3.81	0.9581972	0.9383005	0.9367608
28	64 21 34.5	2 13.13	1 36.7	1 51 36 2	3.83	0.9581693	0.9352381	0.9337342
Oct. 2	64 30 27.1	2 13.15	1 36.7	1 51 20.9	3.84	0.9581416	0.9322516	0.9307929
6	64 39 19.7	2 13.17	1 36.8	1 51 5.5	3.85	0.9581141	0.9293601	0.9279555
10	64 48 12.5	2 13.18	− 1 36.8	− 1 50 49.9	+ 3.87	0.9580867	0.9265812	0.9252394
14	64 57 5.2	2 13.20	1 36.9	1 50 34.4	3.88	0.9580594	0.9239322	0.9226617
18	65 5 58.1	2 13.22	1 36.9	1 50 18.8	3.88	0.9580322	0.9214299	0.9202389
22	65 14 51.0	2 13.22	1 37.0	1 50 3.2	3.89	0.9580051	0.9190907	0.9179874
26	65 23 43.9	2 13.24	1 37.0	1 49 47.6	3.91	0.9579781	0.9169312	0.9159244
30	65 32 37.0	2 13.25	− 1 37.0	− 1 49 31.8	+ 3.92	0.9579514	0.9149688	0.9140665
Nov. 3	65 41 30.0	2 13.27	1 37.1	1 49 15.9	3.93	0.9579248	0.9132192	0.9124288
7	65 50 23.1	2 13.29	1 37.1	1 49 0.1	3.95	0.9578983	0.9116967	0.9110244
11	65 59 16.4	2 13.30	1 37.1	1 48 44.3	3.96	0.9578719	0.9104129	0.9098636
15	66 8 9.6	2 13.31	1 37.2	1 48 28.5	3.97	0.9578456	0.9093775	0.9089557
19	66 17 2.9	2 13.33	− 1 37.2	− 1 48 12.5	+ 3.99	0.9578195	0.9085990	0.9083083
23	66 25 56.3	2 13.35	1 37.2	1 47 56.5	4.00	0.9577936	0.9080842	0.9079276
27	66 34 49.8	2 13.36	1 37.3	1 47 40.4	4.00	0.9577677	0.9078389	0.9078188
Dec. 1	66 43 43.3	2 13.38	1 37.3	1 47 24.3	4.01	0.5577421	0.9078670	0.9079834
5	66 52 36.8	2 13.39	1 37.3	1 47 8.3	4.03	0.9577165	0.9081681	0.9084204
9	67 1 30.4	2 13.41	− 1 37.3	− 1 46 52.1	+ 4.04	0.9576912	0.9087395	0.9091248
13	67 10 24.1	2 13.43	1 37.3	1 46 35.8	4.04	0.9576658	0.9095754	0.9100902
17	67 19 17.9	2 13.44	1 37.3	1 46 19.5	4.05	0.9576407	0.9106685	0.9113092
21	67 28 11.7	2 13.45	1 37.3	1 46 3.2	4.07	0.9576157	0.9120110	0.9127729
25	67 37 5.5	2 13.47	1 37.3	1 45 47.0	4.07	0.9575907	0.9135932	0.9144705
29	67 45 59.4	2 13.48	− 1 37.3	− 1 45 30.5	+ 4.08	0.9575660	0.9154030	0.9163889
33	67 54 53.3	2 13.49	− 1 37.3	− 1 45 14.0	+ 4.10	0.9575413	0.9174263	

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 3	170 25 59.4	46.63	−2.3	+0 46 0.5	−0.08	1.2620331	1.2536009	1.2520420
11	170 32 12.3	46.63	2.3	0 45 59.9	0.08	1.2620355	1.2505258	1.2490599
19	170 38 25.3	46.63	2.4	0 45 59.3	0.08	1.2620379	1.2476531	1.2463135
27	170 44 38.4	46.63	2.4	0 45 58.7	0.08	1.2620403	1.2450478	1.2438630
Feb. 4	170 50 51.4	46.63	2.4	0 45 58.0	0.08	1.2620428	1.2427668	1.2417661
12	170 57 4.4	46.63	−2.4	+0 45 57.4	−0.08	1.2620454	1.2408676	1.2400760
20	171 3 17.4	46.63	2.5	0 45 56.8	0.08	1.2620480	1.2393956	1.2388301
28	171 9 30.4	46.63	2.5	0 45 56.1	0.08	1.2620507	1.2383829	1.2380567
Mar. 8	171 15 43.5	46.63	2.6	0 45 55.4	0.08	1.2620535	1.2378536	1.2377747
16	171 21 56.5	46.63	2.6	0 45 54.7	0.09	1.2620563	1.2378203	1.2379891
24	171 28 9.6	46.63	−2.6	+0 45 54.0	−0.09	1.2620592	1.2382793	1.2386885
Apr. 1	171 34 22.6	46.63	2.6	0 45 53.3	0.09	1.2620621	1.2392137	1.2398520
9	171 40 35.6	46.63	2.7	0 45 52.6	0.09	1.2620651	1.2405997	1.2414514
17	171 46 48.7	46.63	2.7	0 45 51.8	0.09	1.2620682	1.2424012	1.2434431
25	171 53 1.8	46.63	2.8	0 45 51.1	0.09	1.2620713	1.2445702	1.2457761
May 3	171 59 14.8	46.63	−2.8	+0 45 50.4	−0.09	1.2620745	1.2470550	1.2483996
11	172 5 27.9	46.63	2.8	0 45 49.7	0.09	1.2620777	1.2498020	1.2512542
19	172 11 40.9	46.63	2.8	0 45 48.9	0.09	1.2620810	1.2527483	1.2542769
27	172 17 54.0	46.63	2.9	0 45 48.1	0.09	1.2620844	1.2558328	1.2574089
June 4	172 24 7.0	46.63	2.9	0 45 47.3	0.10	1.2620878	1.2589980	1.2605922
12	172 30 20.1	46.63	−2.9	+0 45 46.6	−0.10	1.2620913	1.2621837	1.2637655
20	172 36 33.2	46.63	3.0	0 45 45.8	0.10	1.2620948	1.2653310	1.2668743
28	172 42 46.2	46.63	3.0	0 45 45.0	0.10	1.2620984	1.2683896	1.2698706
July 6	172 48 59.3	46.63	3.0	0 45 44.3	0.10	1.2621021	1.2713109	1.2727050
14	172 55 12.4	46.63	3.1	0 45 43.5	0.10	1.2621058	1.2740475	1.2753335
22	173 1 25.4	46.63	−3.1	+0 45 42.7	−0.10	1.2621096	1.2765584	1.2777186
30	173 7 38.5	46.63	3.1	0 45 41.8	0.10	1.2621134	1.2788099	1.2798279
Aug. 7	173 13 51.6	46.63	3.2	0 45 41.0	0.10	1.2621173	1.2807688	1.2816290
15	173 20 4.6	46.63	3.2	0 45 40.2	0.11	1.2621213	1.2824058	1.2830972
23	173 26 17.7	46.63	3.2	0 45 39.3	0.11	1.2621253	1.2837009	1.2842144
31	173 32 30.7	46.63	−3.3	+0 45 38.4	−0.11	1.2621294	1.2846356	1.2849624
Sept. 8	173 38 43.8	46.63	3.3	0 45 37.6	0.11	1.2621335	1.2851935	1.2853284
16	173 44 56.9	46.63	3.3	0 45 36.7	0.11	1.2621377	1.2853660	1.2853069
24	173 51 9.9	46.63	3.4	0 45 35.8	0.11	1.2621419	1.2851509	1.2848974
Oct. 2	173 57 23.0	46.63	3.4	0 45 34.9	0.11	1.2621462	1.2845466	1.2840992
10	174 3 36.1	46.63	−3.4	+0 45 34.0	−0.11	1.2621506	1.2835567	1.2829213
18	174 9 49.1	46.63	3.4	0 45 33.0	0.12	1.2621550	1.2821946	1.2813789
26	174 16 2.2	46.63	3.5	0 45 32.1	0.12	1.2621595	1.2804761	1.2794891
Nov. 3	174 22 15.2	46.63	3.5	0 45 31.1	0.12	1.2621641	1.2784211	1.2772760
11	174 28 28.3	46.63	3.6	0 45 30.2	0.12	1.2621687	1.2760585	1.2747733
19	174 34 41.4	46.63	−3.6	+0 45 29.2	−0.12	1.2621734	1.2734248	1.2720178
27	174 40 54.4	46.63	3.6	0 45 28.3	0.12	1.2621781	1.2705575	1.2690500
Dec. 5	174 47 7.5	46.63	3.6	0 45 27.3	0.12	1.2621829	1.2675023	1.2659215
13	174 53 20.5	46.63	3.7	0 45 26.3	0.12	1.2621877	1.2643149	1.2626890
21	174 59 33.6	46.63	3.7	0 45 25.3	0.12	1.2621926	1.2610512	1.2594096
29	175 5 46.6	46.63	−3.7	+0 45 24.3	−0.12	1.2621975	1.2577719	1.2561468
37	175 11 59.7	46.63	−3.8	+0 45 23.3	−0.13	1.2622025	1.2545431	

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 3	47 44 55.1	22.10	− 12.5	− 1 45 59.3	+ 0.09	1.4745244	1.4664180	1.4672978
11	47 47 51.8	22.10	12.6	1 45 58.6	0.09	1.4745242	1.4682111	1.4691530
19	47 50 48.6	22.10	12.7	1 45 57.9	0.09	1.4745240	1.4701184	1.4711024
27	47 53 45.4	22.10	12.7	1 45 57.2	0.09	1.4745237	1.4721003	1.4731073
Feb. 4	47 56 42.2	22.10	12.8	1 45 56.5	0.09	1.4745234	1.4741181	1.4751275
12	47 59 38.9	22.10	− 12.9	− 1 45 55.7	+ 0.09	1.4745231	1.4761300	1.4771207
20	48 2 35.7	22.10	13.0	1 45 55.0	0.09	1.4745229	1.4780954	1.4790501
28	48 5 32.5	22.10	13.1	1 45 54.3	0.09	1.4745227	1.4799805	1.4808825
Mar. 8	48 8 29.2	22.09	13.1	1 45 53.5	0.09	1.4745225	1.4817520	1.4825849
16	48 11 26.0	22.09	13.2	1 45 52.8	0.09	1.4745222	1.4833781	1.4841286
24	48 14 22.7	22.09	− 13.3	− 1 45 52.1	+ 0.09	1.4745219	1.4848337	1.4854908
Apr. 1	48 17 19.5	22.09	13.4	1 45 51.3	0.09	1.4745216	1.4860970	1.4866492
9	48 20 16.2	22.09	13.5	1 45 50.6	0.09	1.4745213	1.4871455	1.4875850
17	48 23 12.9	22.09	13.6	1 45 49.8	0.09	1.4745210	1.4879666	1.4882891
25	48 26 9.7	22.09	13.6	1 45 49.1	0.10	1.4745207	1.4885511	1.4887515
May 3	48 29 6.4	22.09	− 13.7	− 1 45 48.3	+ 0.10	1.4745204	1.4888894	1.4889647
11	48 32 3.2	22.09	13.8	1 45 47.5	0.10	1.4745201	1.4889779	1.4889287
19	48 34 59.9	22.09	13.9	1 45 46.7	0.10	1.4745198	1.4888177	1.4886454
27	48 37 56.6	22.09	13.9	1 45 46.0	0.10	1.4745195	1.4884124	1.4881195
June 4	48 40 53.3	22.09	14.0	1 45 45.2	0.10	1.4745192	1.4877679	1.4873591
12	48 43 50.0	22.09	− 14.1	− 1 45 44.4	+ 0.10	1.4745189	1.4868950	1.4863774
20	48 46 46.8	22.09	14.2	1 45 43.6	0.10	1.4745186	1.4858081	1.4851891
28	48 49 43.5	22.09	14.3	1 45 42.8	0.10	1.4745182	1.4845228	1.4838115
July 6	48 52 40.2	22.09	14.4	1 45 42.0	0.10	1.4745179	1.4830580	1.4822658
14	48 55 36.9	22.09	14.5	1 45 41.2	0.10	1.4745176	1.4814382	1.4805784
22	48 58 33.6	22.09	− 14.5	− 1 45 40.4	+ 0.10	1.4745173	1.4796895	1.4787747
30	49 1 30.3	22.09	14.6	1 45 39.6	0.10	1.4745169	1.4778377	1.4768828
Aug. 7	49 4 26.9	22.09	14.7	1 45 38.8	0.10	1.4745165	1.4759145	1.4749371
15	49 7 23.6	22.08	14.8	1 45 37.9	0.10	1.4745162	1.4739549	1.4729719
23	49 10 20.3	22.08	14.9	1 45 37.1	0.10	1.4745159	1.4719922	1.4710202
31	49 13 17.0	22.08	− 14.9	− 1 45 36.3	+ 0.10	1.4745156	1.4700607	1.4691188
Sept. 8	49 16 13.6	22.08	15.0	1 45 35.4	0.10	1.4745152	1.4681995	1.4673074
16	49 19 10.3	22.08	15.1	1 45 34.6	0.11	1.4745148	1.4664466	1.4656210
24	49 22 7.0	22.08	15.2	1 45 33.8	0.11	1.4745145	1.4648352	1.4640939
Oct. 2	49 25 3.6	22.08	15.3	1 45 32.9	0.11	1.4745141	1.4634012	1.4627612
10	49 28 0.3	22.08	− 15.3	− 1 45 32.0	+ 0.11	1.4745137	1.4621773	1.4616530
18	49 30 56.9	22.08	15.4	1 45 31.2	0.11	1.4745133	1.4611911	1.4607942
26	49 33 53.6	22.08	15.5	1 45 30.3	0.11	1.4745129	1.4604648	1.4602058
Nov. 3	49 36 50.2	22.08	15.6	1 45 29.5	0.11	1.4745126	1.4600187	1.4599052
11	49 39 46.9	22.08	15.7	1 45 28.6	0.11	1.4745123	1.4598652	1.4598990
19	49 42 43.5	22.08	− 15.8	− 1 45 27.7	+ 0.11	1.4745119	1.4600072	1.4601897
27	49 45 40.2	22.08	15.8	1 45 26.8	0.11	1.4745115	1.4604455	1.4607729
Dec. 5	49 48 36.8	22.08	15.9	1 45 25.9	0.11	1.4745111	1.4611700	1.4616348
13	49 51 33.4	22.08	16.0	1 45 25.0	0.11	1.4745108	1.4621647	1.4627567
21	49 54 30.0	22.08	16.1	1 45 24.2	0.11	1.4745104	1.4634073	1.4641128
29	49 57 26.6	22.08	− 16.1	− 1 45 23.3	+ 0.11	1.4745100	1.4648697	1.4656739
37	50 0 23.2	22.08	− 16.1	− 1 45 22.4	+ 0.11	1.4745096	1.4665211	

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 1	+0.1841347	+0.1927200	– 639	–0.8860735	–0.8845390	+ 14	–0.3844045	–0.3837381	– 337
2	0.2012908	0.2098466	645	0.8829356	0.8812632	+ 1	0.3830424	0.3823165	341
3	0.2183865	0.2269096	650	0.8795220	0.8777121	– 11	0.3815608	0.3807753	346
4	0.2354151	0.2439025	655	0.8758337	0.8738868	24	0.3799601	0.3791152	350
5	0.2523713	0.2608207	660	0.8718715	0.8697880	37	0.3782406	0.3773364	354
6	+0.2692501	+0.2776586	– 664	–0.8676365	–0.8654172	– 51	–0.3764027	–0.3754395	– 358
7	0.2860454	0.2944098	668	0.8631302	0.8607756	64	0.3744470	0.3734253	362
8	0.3027513	0.3110691	671	0.8583538	0 8558648	78	0.3723744	0.3712944	366
9	0.3193625	0.3276309	674	0.8533089	0.8506862	92	0.3701855	0.3690477	370
10	0.3358736	0.3440899	677	0.8479970	0.8452415	106	0.3678811	0.3666857	374
11	+0.3522793	+0.3604410	– 680	–0.8424200	–0.8395329	– 120	–0.3654617	–0.3642092	– 378
12	0.3685742	0.3766783	683	0.8365801	0.8335622	135	0.3629283	0.3616191	381
13	0.3847528	0.3927970	685	0.8304794	0.8273319	150	0.3602817	0.3589163	385
14	0.4008103	0.4087919	686	0.8241201	0.8208442	165	0.3575231	0.3561022	388
15	0.4167414	0.4246580	687	0.8175045	0.8141014	180	0.3546536	0.3531776	392
16	+0.4325412	+0.4403906	– 688	–0.8106352	–0.8071062	– 195	–0 3516744	–0.3501439	– 395
17	0.4482054	0.4559851	688	0.8035148	0.7998613	210	0.3485863	0.3470017	399
18	0.4637292	0.4714371	688	0.7961460	0.7923691	226	0.3453903	0.3437521	402
19	0.4791082	0.4867419	688	0.7885310	0.7846319	241	0.3420873	0.3403961	406
20	0.4943376	0.5018949	687	0.7806723	0.7766526	257	0.3386786	0.3369350	409
21	+0.5094132	+0.5168919	– 686	–0.7725731	–0.7684339	– 273	–0.3351654	–0.3333699	– 413
22	0.5243306	0.5317288	684	0.7642355	0.7599781	289	0.3315488	0.3297020	416
23	0.5390859	0.5464015	682	0.7556621	0.7512878	305	0.3278297	0.3259320	419
24	0 5536750	0.5609058	680	0.7468555	0.7423656	321	0.3240092	0.3220614	422
25	0.5680935	0.5752375	678	0.7378184	0.7332143	337	0.3200887	0.3180911	425
26	+0.5823374	+0.5893925	– 675	–0.7285536	–0.7238366	– 353	–0.3160690	–0.3140225	– 428
27	0.5964024	0.6033665	671	0.7190637	0.7142352	369	0.3119518	0.3098568	431
28	0.6102843	0.6171552	667	0.7093514	0.7044126	385	0.3077377	0.3055948	434
29	0.6239788	0.6307546	663	0.6994191	0.6943715	401	0.3034282	0.3012380	437
30	0.6374818	0.6441599	658	0.6892700	0.6841150	417	0.2990246	0.2967879	440
31	+0.6507885	+0.6573672	– 653	–0.6789067	–0.6736458	– 433	–0.2945280	–0.2922453	– 443
Feb. 1	0.6638953	0.6703723	647	0.6683325	0.6629672	450	0.2899400	0.2876120	446
2	0.6767978	0.6831711	641	0.6575503	0.6520823	466	0.2852617	0.2828894	448
3	0.6894918	0.6957593	635	0.6465636	0.6409946	482	0.2804951	0.2780789	450
4	0.7019731	0.7081327	629	0.6353758	0.6297077	498	0.2756410	0.2731818	452
5	+0.7142375	+0.7202871	– 622	–0.6239906	–0.6182250	– 514	–0.2707013	–0.2681999	– 454
6	0.7262809	0.7322185	614	0.6124114	0.6065500	530	0.2656778	0.2631350	456
7	0.7380993	0.7439229	606	0.6006417	0.5946869	546	0.2605718	0.2579885	458
8	0.7496889	0.7553968	598	0.5886862	0.5826400	562	0.2553855	0.2527626	460
9	0.7610461	0.7666365	589	0.5765489	0.5704132	577	0.2501202	0.2474586	462
10	+0.7721676	+0.7776388	– 580	–0.5642337	–0.5580108	– 593	–0.2447779	–0.2420784	– 464
11	0.7830499	0.7884004	571	0.5517450	0.5454368	608	0.2393604	0.2366240	466
12	0.7936900	0.7989184	561	0.5390868	0.5326956	623	0.2338695	0.2310971	468
13	0.8040850	0.8091895	551	0.5262637	0.5197916	638	0.2283070	0.2254996	469
14	0.8142316	0.8192109	540	0.5132798	0.5067290	653	0.2226750	0.2198333	470
15	+0.8241272	+0.8289801	– 529	–0.5001397	–0.4935123	– 667	–0.2169749	–0.2141002	– 471

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 15	+0.8241272	+0.8289801	− 529	−0.5001397	−0.4935123	− 667	−0.2169749	−0.2141002	− 471
16	0.8337694	0.8384948	518	0.4868474	0.4801457	681	0.2112092	0.2083022	472
17	0.8431558	0.8477522	507	0.4734075	0.4666334	695	0.2053792	0.2024406	473
18	0.8522837	0.8567500	495	0.4598239	0.4529797	709	0.1994867	0.1965176	474
19	0.8611510	0.8654864	482	0.4461012	0.4391888	723	0.1935336	0.1905349	475
20	+0.8697559	+0.8739592	− 469	−0.4322431	−0.4252648	− 737	−0.1875217	−0.1844944	− 476
21	0.8780959	0.8821659	456	0.4182544	0.4112122	751	0.1814531	0.1783979	476
22	0.8861687	0.8901042	443	0.4041388	0.3970348	764	0.1753291	0.1722471	477
23	0.8939724	0.8977728	429	0.3899007	0.3827369	777	0.1691519	0.1660437	477
24	0 9015050	0.9051688	415	0.3755438	0.3683220	790	0.1629229	0.1597897	478
25	+0.9087641	+0.9122909	− 401	−0.3610721	−0.3537946	− 803	−0.1566442	−0.1534866	− 478
26	0.9157486	0.9191370	387	0 3464900	0.3391589	815	0.1503173	0.1471365	478
27	0.9224559	0.9257048	372	0.3318017	0.3244189	827	0.1439442	0.1407410	478
28	0.9288834	0.9319916	357	0.3170112	0.3095791	839	0.1375270	0.1343024	478
Mar. 1	0.9350294	0.9379962	342	0.3021231	0.2946438	851	0.1310675	0.1278225	477
2	+0.9408918	+0.9437160	− 326	−0.2871418	−0.2796177	− 863	−0.1245677	−0.1213033	− 477
3	0.9464686	0.9491494	310	0.2720720	0.2645054	874	0.1180295	0.1147466	476
4	0.9517581	0.9542947	294	0.2569183	0.2493113	885	0.1114549	0.1081547	475
5	0.9567590	0.9591507	279	0.2416852	0.2340405	896	0.1048462	0.1015296	474
6	0.9614694	0.9637151	262	0.2263777	0.2186976	907	0.0982054	0.0948737	473
7	+0.9658876	+0.9679869	− 245	−0.2110007	−0.2032877	− 917	−0.0915346	−0.0881885	− 472
8	0.9700126	0.9719646	228	0.1955592	0.1878158	927	0.0848356	0.0814763	471
9	0.9738428	0.9756472	211	0.1800580	0.1722867	936	0.0781110	0.0747398	469
10	0.9773776	0.9790337	194	0.1645024	0.1567058	945	0.0713630	0.0679808	468
11	0.9806156	0.9821234	176	0.1488973	0.1410777	954	0.0645936	0.0612015	466
12	+0.9835569	+0.9849159	− 158	−0.1332477	−0.1254079	− 963	−0.0578049	−0.0544040	− 465
13	0.9862006	0.9874108	140	0.1175589	0.1097013	971	0.0509992	0.0475907	463
14	0.9885465	0.9896077	122	0.1018356	0.0939627	979	0.0441787	0.0407636	461
15	0.9905943	0.9915065	103	0.0860832	0.0781976	987	0.0373455	0.0339247	459
16	0.9923441	0.9931072	85	0.0703066	0.0624107	995	0.0305016	0.0270763	457
17	+0.9937960	+0.9944105	− 66	−0.0545105	−0.0466065	−1002	−0.0236491	−0.0202203	− 455
18	0.9949505	0.9954161	47	0.0386994	0.0307898	1009	0.0167901	0.0133589	453
19	0.9958074	0.9961243	28	0.0228782	−0.0149651	1015	0.0099267	−0.0064939	450
20	0.9963671	0.9965358	− 9	−0.0070511	+0.0008632	1021	−0.0030605	+0.0003730	447
21	0.9966303	0.9966506	+ 11	+0.0087771	0.0166902	1027	+0.0038064	0.0072395	444
22	+0.9965968	+0.9964691	+ 30	+0.0246020	+0.0325118	−1033	+0.0106720	+0.0141036	− 441
23	0.9962674	0.9959917	50	0.0404190	0.0483233	1038	0.0175343	0.0209637	437
24	0.9956421	0.9952187	70	0.0562240	0.0641205	1043	0.0243915	0.0278176	434
25	0.9947215	0.9941505	90	0.0720125	0.0798992	1048	0.0312416	0.0346635	430
26	0.9935059	0.9927878	110	0.0877801	0.0956548	1052	0.0380828	0.0414995	426
27	+0.9919961	+0.9911309	+ 130	+0.1035226	+0.1113830	−1056	+0.0449132	+0.0483236	− 422
28	0.9901923	0.9891804	150	0.1192354	0.1270794	1060	0.0517305	0.0551338	418
29	0.9880952	0 9869367	170	0.1349144	0.1427398	1063	0.0585331	0.0619282	413
30	0.9857050	0.9844004	190	0.1505548	0.1583591	1066	0.0653187	0.0687047	409
31	0.9830228	0.9815722	211	0.1661519	0.1739328	1069	0.0720857	0.0754616	404
32	+0.9800489	+0.9784527	+ 231	+0.1817013	+0.1894568	−1072	+0.0788319	+0.0821965	− 400

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
April 1	+0.9800489	+0.9784527	+ 231	+0.1817013	+0.1894568	–1072	+0.0788319	+0.0821965	– 400
2	0.9767838	0.9750423	252	0.1971985	0.2049258	1075	0.0855550	0.0889074	395
3	0.9732285	0.9713424	272	0.2126383	0.2203354	1077	0.0922532	0.0955924	390
4	0.9693843	0.9673544	292	0.2280164	0.2356807	1079	0.0989245	0.1022493	385
5	0.9652528	0.9630795	313	0.2433277	0.2509568	1080	0.1055666	0.1088762	380
6	+0.9608347	+0.9585186	+ 335	+0.2585674	+0.2661590	–1081	+0.1121776	+0.1154707	– 374
7	0.9561315	0.9536737	356	0.2737309	0.2812824	1082	0.1187552	0.1220309	369
8	0.9511452	0:9485465	377	0.2888131	0.2963224	1082	0.1252976	0.1285551	363
9	0.9458779	0.9431394	398	0.3038097	0.3112744	1082	0.1318030	0.1350410	358
10	0.9403312	0.9374537	419	0.3187160	0.3261339	1082	0.1382690	0.1414868	352
11	+0.9345072	+0.9314920	+ 440	+0.3335275	+0.3408963	–1082	+0.1446940	+0.1478904	– 346
12	0.9284085	0.9252569	461	0.3482397	0.3555573	1081	0.1510758	0.1542500	340
13	0.9220375	0.9187504	482	0.3628483	0.3701123	1080	0.1574128	0.1605640	334
14	0.9153962	0.9119751	504	0.3773488	0.3845573	1079	0.1637033	0.1668305	327
15	0.9084875	0.9049337	525	0.3917373	0.3988882	1078	0.1699453	0.1730475	320
16	+0.9013140	+0.8976287	+ 546	+0.4060097	+0.4131013	–1076	+0.1761369	+0.1792135	– 313
17	0.8938781	0.8900626	567	0.4201625	0.4271928	1074	0.1822769	0.1853270	306
18	0.8861826	0.8822382	588	0.4341919	0.4411592	1072	0.1883635	0.1913862	299
19	0.8782298	0.8741578	610	0.4480943	0.4549968	1069	0.1943950	0.1973896	292
20	0.8700226	0.8658243	631	0.4618662	0.4687020	1066	0.2003699	0.2033358	285
21	+0.8615635	+0.8572403	+ 652	+0.4755038	+0.4822710	–1062	+0.2062869	+0.2092232	– 279
22	0.8528552	0.8484084	674	0.4890033	0.4957002	1058	0.2121442	0.2150497	271
23	0.8439002	0 8393310	695	0.5023612	0.5089860	1054	0.2179396	0.2208139	264
24	0.8347012	0.8300109	716	0.5155741	0.5221251	1049	0.2236723	0 2265147	256
25	0.8252604	0.8204501	737	0.5286387	0.5351143	1044	0.2293407	0.2321502	248
26	+0.8155804	+0.8106516	+ 759	+0.5415514	+0.5479496	–1039	+0.2349430	+0.2377189	– 240
27	0.8056640	0.8006180	780	0.5543084	0.5606275	1034	0.2404777	0.2432193	232
28	0.7955139	0.7903522	801	0.5669064	0.5731446	1028	0.2459433	0.2486496	224
29	0.7851332	0.7798572	822	0.5793418	0.5854974	1022	0.2513381	0.2540086	216
30	0.7745242	0.7691349	844	0.5916111	0.5976822	1015	0.2566607	0.2592944	207
May 1	+0.7636896	+0.7581890	+ 865	+0.6037103	+0.6096950	–1008	+0.2619093	+0.2645054	– 199
2	0.7526335	0.7470234	886	0.6156358	0.6215322	1001	0.2670824	0.2696402	190
3	0.7413589	0.7356403	907	0.6273838	0.6331901	994	0.2721785	0.2746971	181
4	0.7298682	0.7240432	928	0.6389508	0 6446654	986	0.2771960	0.2796749	172
5	0.7181658	0.7122363	949	0.6503336	0.6559549	978	0.2821335	0.2845717	163
6	+0.7062551	+0.7002228	+ 970	+0.6615288	+0.6670547	– 969	+0.2869894	+0.2893863	– 154
7	0.6941400	0.6880070	991	0.6725323	0.6779613	959	0.2917623	0.2941170	145
8	0.6818242	0.6755922	1011	0.6833411	0.6886715	949	0.2964504	0.2987625	135
9	0.6693115	0.6629828	1031	0.6939521	0.6991825	939	0.3010530	0.3033218	126
10	0.6566064	0.6501829	1051	0.7043623	0.7094912	929	0.3055686	0.3077935	116
11	+0.6437127	+0 6371964	+1071	+0.7145690	+0.7195952	– 918	+0.3099962	+0.3121764	– 106
12	0.6306347	0.6240280	1091	0.7245694	0.7294913	907	0.3143340	0.3164691	96
13	0.6173768	0.6106817	1111	0.7343605	0.7391768	896	0.3185814	0.3206708	86
14	0.6039432	0.5971618	1131	0.7439399	0.7486495	885	0.3227372	0.3247805	76
15	0.5903381	0.5834726	1151	0.7533055	0.7579074	873	0.3268005	0.3287971	66
16	+0.5765659	+0.5696182	+1170	+0.7624551	+0.7669482	– 861	+0.3307701	+0.3327194	– 56

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 16	+0.5765659	+0.5696182	+1170	+0.7624551	+0.7669482	– 861	+0.3307701	+0.3327194	– 56
17	0.5626301	0.5556023	1190	0.7713863	0.7757694	848	0.3346450	0.3365468	46
18	0.5485353	0.5414294	1209	0.7800972	0.7843694	835	0.3384246	0.3402782	35
19	0.5342854	0.5271034	1228	0.7885860	0.7927465	821	0.3421077	0.3439130	25
20	0.5198841	0.5126280	1247	0.7968506	0.8008981	807	0.3456937	0.3474498	14
21	+0.5053356	+0.4980077	+1266	+0.8048889	+0.8088226	– 793	+0.3491813	+0.3508881	– 3
22	0.4906442	0.4832459	1284	0.8126989	0.8165177	778	0.3525700	0.3542270	+ 8
23	0.4758133	0.4683468	1303	0 8202786	0.8239814	763	0.3558588	0.3574653	19
24	0.4608470	0.4533146	1321	0.8276260	0.8312121	747	0.3590465	0.3606023	30
25	0.4457500	0.4381534	1339	0.8347394	0.8382079	731	0.3621327	0.3636375	40
26	+0.4305253	+0.4228663	+1356	0.8416173	+0.8449672	– 715	+0.3651166	+0.3665698	+ 51
27	0.4151771	0.4074581	1374	0.8482572	0.8514872	699	0.3679970	0.3693982	62
28	0.3997098	0.3919330	1391	0.8546571	0.8577665	682	0.3707732	0.3721219	73
29	0.3841277	0.3762950	1408	0.8608149	0.8638023	665	0.3734442	0.3747399	84
30	0.3684350	0.3605486	1425	0.8667287	0.8695936	647	0.3760091	0.3772517	95
31	+0.3526361	+0.3446983	+1442	+0.8723967	+0.8751379	– 629	+0 3784675	+0.3796563	+ 106
June 1	0.3367356	0.3287488	1459	0.8778170	0.8804337	610	0.3808181	0.3819529	117
2	0.3207384	0.3127048	1475	0.8829879	0.8854794	591	0.3830607	0.3841412	128
3	0.3046487	0.2965708	1490	0.8879080	0.8902733	572	0.3851943	0.3862200	140
4	0.2884716	0.2803518	1505	0.8925753	0.8948137	552	0.3872183	0.3881891	151
5	+0.2722124	+0.2640537	+1520	+0.8969885	+0.8990993	– 532	+0.3891322	+0.3900475	+ 162
6	0.2558759	0.2476796	1535	0.9011461	0.9031288	511	0.3909351	0.3917950	174
7	0.2394661	0.2312356	1549	0.9050473	0.9069015	490	0.3926271	0.3934313	186
8	0.2229888	0.2147265	1563	0.9086912	0.9104162	469	0.3942075	0.3949557	197
9	0.2064492	0.1981577	1577	0.9120766	0.9136722	448	0.3956758	0.3963679	209
10	+0.1898524	+0.1815341	+1590	+0.9152028	+0.9166685	– 426	+0.3970320	+0.3976680	+ 220
11	0.1732034	0.1648608	1603	0.9180692	0.9194050	403	0.3982758	0.3988554	232
12	0.1565070	0.1481425	1616	0.9206757	0.9218812	380	0.3994068	0.3999299	244
13	0.1397680	0.1313838	1628	0.9230217	0.9240971	357	0.4004248	0.4008915	255
14	0.1229904	0.1145890	1640	0.9251073	0.9260522	334	0.4013300	0.4017402	266
15	+0.1061796	+0.0977632	+1651	+0.9269318	+0.9277462	– 310	+0.4021220	+0.4024756	+ 278
16	0.0893402	0.0809115	1662	0.9284954	0.9291794	286	0.4028010	0.4030981	290
17	0.0724774	0.0640385	1672	0.9297981	0.9303516	261	0.4033669	0.4036073	302
18	0.0555952	0.0471480	1682	0.9308399	0.9312629	236	0.4038194	0.4040032	313
19	0.0386978	0.0302450	1692	0.9316207	0.9319132	210	0.4041587	0.4042858	325
20	+0.0217898	+0.0133332	+1701	+0.9321403	+0.9323020	– 186	+0.4043845	+0.4044548	+ 337
21	+0.0048755	–0.0035826	1709	0.9323983	0.9324293	160	0.4044966	0.4045101	349
22	–0.0120406	0.0204979	1717	0.9323949	0.9322952	134	0.4044952	0.4044518	360
23	0.0289539	0.0374082	1726	0.9321302	0.9318999	107	0.4043801	0.4042801	372
24	0.0458600	0.0543090	1733	0.9316043	0.9312433	81	0.4041518	0.4039953	383
25	–0.0627545	–0.0711959	+1740	+0.9308170	+0.9303254	– 54	+0.4038104	+0.4035970	+ 395
26	0.0796327	0.0880642	1746	0.9297684	0.9291459	– 27	0.4033550	0.4030847	406
27	0.0964900	0.1049095	1751	0.9284579	0.9277046	+ 1	0.4027859	0.4024588	418
28	0.1133220	0.1217270	1756	0.9268859	0.9260018	28	0.4021032	0.4017193	429
29	0.1301235	0.1385114	1761	0.9250525	0.9240379	56	0.4013071	0.4008667	441
30	–0.1468897	–0.1552577	+1765	+0.9229581	+0.9218131	+ 84	+0.4003979	+0.3999008	+ 452

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.1636156	−0.1719619	+1768	+0.9206028	+0.9193273	+ 113	+0.3993755	+0.3988218	+ 464
2	0.1802963	0.1886182	1771	0.9179867	0.9165811	141	0.3982398	0.3976297	475
3	0.1969269	0.2052218	1773	0.9151106	0.9135753	170	0.3969915	0.3963252	486
4	0.2135022	0.2217677	1775	0.9119753	0.9103107	199	0.3956309	0.3949087	498
5	0.2300174	0.2382508	1776	0.9085818	0.9067886	229	0.3941586	0.3933805	509
6	−0.2464673	−0.2546663	+1777	+0.9049312	+0.9030098	+ 258	+0.3925745	+0.3917409	+ 520
7	0.2628472	0.2710091	1777	0.9010245	0.8989754	288	0.3908797	0.3899908	531
8	0.2791516	0.2872741	1776	0.8968627	0.8946867	318	0.3890744	0.3881306	542
9	0.2953759	0.3034565	1775	0.8924475	0.8901453	348	0.3871595	0.3861610	553
10	0.3115155	0.3195522	1773	0.8877804	0.8853530	378	0.3851351	0.3840821	564
11	−0.3275661	−0.3355565	+1772	+0.8828632	+0.8803111	+ 409	+0.3830023	+0.3818955	+ 574
12	0.3435229	0.3514647	1769	0.8776972	0.8750216	439	0.3807618	0.3796014	585
13	0.3593813	0.3672722	1765	0.8722845	0.8694862	470	0.3784144	0.3772008	595
14	0.3751370	0.3829750	1760	0.8666269	0.8637068	500	0.3759607	0.3746942	606
15	0.3907859	0.3985691	1755	0.8607262	0.8576853	531	0.3734015	0.3720826	616
16	−0.4063240	−0.4140501	+1749	+0.8545844	+0.8514236	+ 561	+0 3707376	+0.3693666	+ 626
17	0.4217469	0.4294140	1743	0.8482031	0.8449231	592	0.3679698	0.3665473	636
18	0.4370508	0.4446569	1736	0.8415841	0.8381861	622	0.3650991	0.3636252	646
19	0.4522317	0.4597748	1729	0.8347294	0.8312141	653	0.3621256	0.3606006	656
20	0.4672858	0.4747642	1721	0.8276406	0.8240090	683	0.3590504	0.3574750	666
21	−0.4822093	−0.4896206	+1712	+0.8203195	+0.8165725	+ 714	+0.3558744	+0.3542487	+ 675
22	0.4969978	0.5043402	1702	0.8127680	0.8089065	744	0.3525980	0.3509225	684
23	0.5116474	0.5189187	1692	0.8049881	0.8010129	775	0.3492224	0.3474976	693
24	0.5261537	0.5333521	1682	0.7969812	0.7928933	805	0.3457482	0.3439744	702
25	0.5405134	0.5476371	1670	0.7887494	0.7845496	836	0.3421764	0.3403542	711
26	−0.5547224	−0.5617677	+1657	+0.7802942	+0.7759836	+ 866	+0.3385079	+0.3366375	+ 720
27	0.5687746	0.5757417	1644	0.7716179	0.7671974	897	0.3347433	0.3328253	728
28	0.5826683	0.5895538	1631	0.7627225	0.7581934	927	0.3308837	0.3289186	736
29	0.5963979	0.6031999	1617	0.7536105	0.7489737	957	0.3269301	0.3249183	745
30	0.6099593	0.6166757	1602	0.7442835	0.7395404	987	0.3228834	0.3208255	754
31	−0.6233486	−0.6299775	+1587	+0.7347446	+0.7298964	+1017	+0.3187447	+0.3166413	+ 762
Aug. 1	0.6365618	0.6431007	1571	0.7249961	0.7200442	1047	0.3145153	0.3123669	770
2	0.6495938	0.6560407	1555	0.7150410	0.7099868	1076	0.3101964	0.3080039	778
3	0.6624410	0 6687940	1538	0.7048819	0.6997269	1105	0.3057893	0.3035529	786
4	0.6750994	0.6813565	1520	0.6945220	0.6892676	1134	0.3012950	0.2990157	794
5	−0.6875651	−0.6937246	+1501	+0.6839639	+0 6786117	+1163	+0.2967151	+0.2943934	+ 803
6	0.6998345	0.7058942	1482	0.6732112	0.6677629	1191	0.2920508	0.2896874	810
7	0.7119035	0.7178620	1462	0.6622668	0.6567240	1219	0.2873035	0.2848991	817
8	0.7237689	0.7296240	1442	0.6511347	0 6454991	1247	0.2824746	0.2800301	824
9	0.7354270	0.7411773	1421	0.6398178	0.6340913	1275	0.2775658	0.2750819	831
10	−0.7468745	−0.7525183	+1401	+0.6283200	+0.6225043	+1302	+0.2725785	+0.2700559	+ 837
11	0.7581083	0.7636443	1379	0.6166445	0.6107413	1329	0.2675142	0.2649535	844
12	0.7691257	0.7745522	1356	0.6047950	0.5988059	1356	0.2623741	0.2597761	850
13	0.7799236	0.7852394	1332	0.5927744	0.5867010	1382	0.2571599	0 2545255	856
14	0.7904992	0.7957027	1308	0.5805863	0.5744306	1407	0.2518730	0.2492027	861
15	−0.8008495	−0.8059392	+1284	+0.5682345	+0.5619983	+1433	+0.2465148	+0.2438095	+ 867

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.8109718	−0.8159468	+1260	+0.5557225	+0.5494075	+1459	+0.2410870	+0.2383474	+ 872
17	0.8208639	0.8257228	1234	0.5430536	0.5366610	1484	0.2355908	0.2328174	877
18	0.8305231	0.8352645	1208	0.5302302	0.5237617	1509	0.2300274	0.2272211	882
19	0.8399464	0.8445686	1182	0.5172561	0.5107137	1533	0.2243987	0.2215603	887
20	0.8491309	0.8536329	1155	0.5041349	0.4975202	1557	0.2187060	0.2158361	891
21	−0.8580742	−0.8624546	+1127	+0.4908698	+0.4841844	+1581	+0.2129508	+0 2100502	+ 895
22	0.8667737	0.8710310	1099	0.4774642	0.4707095	1604	0.2071344	0.2042037	898
23	0.8752262	0.8793591	1070	0.4639210	0.4570991	1627	0.2012583	0.1982985	902
24	0.8834294	0.8874366	1041	0.4502442	0.4433569	1649	0.1953243	0.1923360	905
25	0.8913803	0.8952604	1011	0.4364374	0.4294864	1670	0.1893339	0.1863182	909
26	−0.8990764	−0.9028280	+ 981	+0.4225043	+0.4154914	+1692	+0.1832890	+0.1802464	+ 912
27	0.9065148	0.9101365	951	0.4084482	0.4013753	1713	0.1771905	0.1741218	915
28	0.9136929	0.9171836	920	0.3942731	0.3871421	1733	0.1710406	0.1679469	918
29	0.9206082	0.9239664	889	0.3799830	0.3727962	1753	0.1648410	0.1617231	921
30	0.9272580	0.9304826	857	0.3655823	0.3583417	1772	0.1585936	0.1554525	924
31	−0.9336400	−0.9367298	+ 825	+0.3510752	+0.3437831	+1791	+0.1523001	+0 1491368	+ 926
Sept. 1	0.9397518	0.9427057	792	0.3364659	0.3291243	1809	0.1459627	0.1427780	928
2	0.9455912	0.9484082	759	0.3217589	0.3143703	1826	0.1395829	0.1363779	929
3	0.9511563	0.9538352	725	0.3069589	0.2995254	1843	0.1331630	0.1299385	930
4	0.9564449	0.9589852	691	0.2920703	0.2845942	1861	0.1267046	0.1234616	931
5	−0.9614558	−0.9638566	+ 657	+0.2770976	+0.2695810	+1877	+0.1202097	+0.1169491	+ 931
6	0.9661873	0.9684477	624	0.2620451	0.2544904	1893	0.1136801	0.1104030	931
7	0.9706376	0.9727571	589	0.2469175	0.2393270	1908	0.1071180	0.1038255	931
8	0.9748060	0.9767841	554	0.2317196	0.2240959	1922	0.1005255	0.0972185	931
9	0.9786911	0.9805272	518	0.2164562	0.2088012	1936	0.0939045	0.0905838	930
10	−0.9822923	−0.9839861	+ 482	+0.2011315	+0.1934476	+1949	+0.0872567	+0.0839234	+ 929
11	0.9856084	0.9871591	446	0.1857499	0.1780390	1961	0.0805841	0.0772391	928
12	0.9886382	0.9900457	410	0.1703155	0.1625800	1973	0.0738884	0.0705326	927
13	0.9913814	0.9926454	373	0.1548329	0.1470749	1986	0.0671717	0.0638061	926
14	0.9938375	0.9949575	336	0.1393065	0.1315282	1997	0.0604359	0.0570613	924
15	−0.9960055	−0.9969813	+ 299	+0.1237406	+0.1159441	+2008	+0.0536825	+0.0503000	+ 922
16	0.9978848	0.9987160	262	0.1081394	0.1003268	2018	0 0469140	0.0435246	920
17	0.9994748	1.0001609	225	0.0925070	0.0846805	2027	0.0401319	0.0367362	918
18	1.0007743	1.0013150	187	0.0768479	0.0690095	2035	0.0333377	0.0299368	916
19	1.0017828	1.0021778	149	0.0611659	0.0533176	2043	0.0265338	0.0231288	914
20	−1.0024999	−1.0027491	+ 111	+0.0454653	+0.0376093	+2051	+0.0197218	+0.0163132	+ 911
21	1.0029252	1.0030280	73	0.0297503	0.0218887	2058	0.0129034	0.0094925	907
22	1.0030575	1.0030137	+ 35	+0.0140252	+0.0061603	2064	+0.0060808	+0.0026687	903
23	1.0028966	1.0027060	− 4	−0.0017054	−0.0095713	2070	−0.0007438	−0.0041564	899
24	1.0024417	1.0021039	43	0.0174368	0.0253013	2075	0.0075688	0.0109808	895
25	−1.0016924	−1.0012071	− 82	−0.0331644	−0.0410256	+2079	−0.0143920	−0.0178024	+ 890
26	1.0006480	1.0000150	121	0.0488840	0.0567392	2083	0.0212116	0.0246194	885
27	0.9993082	0.9985276	160	0.0645907	0.0724378	2087	0.0280255	0.0314296	879
28	0.9976732	0.9967451	199	0.0802798	0.0881160	2089	0.0348315	0.0382308	874
29	0.9957433	0.9946677	238	0.0959458	0.1037687	2091	0.0416275	0.0450211	868
30	−0.9935183	−0.9922951	− 277	−0.1115839	−0.1193910	+2092	−0.0484113	−0.0517978	+ 862

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	–0.9909983	–0.9896278	– 316	–0.1271893	–0.1349782	+2093	–0.0551805	–0.0585592	+ 855
2	0.9881837	0.9866662	354	0.1427570	0.1505251	2093	0.0619334	0.0653029	849
3	0.9850754	0.9834115	394	0.1582817	0.1660263	2093	0.0686676	0.0720273	842
4	0.9816745	0.9798645	433	0.1737585	0.1814776	2092	0.0753813	0.0787297	836
5	0.9779818	0.9760264	473	0.1891831	0.1968743	2090	0.0820722	0.0854086	828
6	–0.9739985	–0.9718981	– 513	–0.2045506	–0.2122115	+2088	–0.0887384	–0.0920615	+ 821
7	0.9697255	0.9674810	553	0.2198564	0.2274845	2085	0.0953777	0.0986869	813
8	0.9651647	0.9627767	593	0.2350952	0.2426881	2081	0.1019886	0.1052825	805
9	0.9603172	0.9577865	632	0.2502627	0.2578183	2077	0.1085684	0.1118462	796
10	0.9551849	0.9525125	671	0.2653543	0.2728702	2072	0.1151155	0.1183760	787
11	–0.9497694	–0.9469558	– 710	–0.2803655	–0.2878397	+2067	–0.1216275	–0.1248701	+ 778
12	0.9440720	0.9411181	749	0.2952921	0.3027222	2061	0.1281033	0.1313268	769
13	0.9380944	0.9350010	788	0.3101296	0.3175139	2055	0.1345406	0.1377443	759
14	0.9318381	0.9286062	827	0.3248744	0.3322106	2048	0.1409377	0.1441206	749
15	0.9253054	0.9219359	866	0.3395219	0.3468078	2040	0.1472927	0.1504539	739
16	–0.9184979	–0.9149916	– 905	–0.3540679	–0.3613019	+2031	–0.1536040	–0.1567425	+ 729
17	0.9114170	0.9077744	944	0.3685091	0.3756889	2022	0.1598694	0.1629845	718
18	0.9040641	0.9002864	983	0.3828409	0.3899644	2012	0.1660875	0.1691780	707
19	0.8964415	0.8925295	1021	0.3970590	0.4041242	2002	0.1722560	0.1753213	696
20	0.8885507	0.8845053	1060	0.4111594	0.4181641	1991	0.1783735	0.1814124	686
21	–0.8803935	–0.8762156	–1098	–0.4251378	–0.4320799	+1980	–0.1844380	–0.1874498	+ 675
22	0.8719718	0.8676623	1136	0.4389899	0.4458672	1968	0.1904475	0.1934310	663
23	0.8632874	0.8588474	1174	0.4527113	0 4595217	1955	0.1964001	0 1993547	650
24	0.8543424	0.8497727	1212	0.4662978	0.4730392	1942	0.2022943	0.2052187	638
25	0.8451388	0.8404408	1249	0.4797454	0.4864156	1928	0.2081279	0.2110214	625
26	–0.8356790	–0.8308538	–1286	–0.4930492	–0.4996458	+1914	–0.2138989	–0.2167603	+ 613
27	0.8259656	0.8210146	1323	0.5062049	0.5127259	1899	0.2196055	0.2224341	600
28	0.8160011	0.8109257	1360	0.5192081	0.5256512	1883	0.2252459	0.2280407	587
29	0.8057887	0.8005905	1396	0.5320545	0.5384173	1867	0.2308182	0.2335782	573
30	0.7953312	0.7900114	1433	0.5447392	0.5510197	1851	0.2363204	0.2390446	560
31	–0.7846315	–0.7791918	–1469	–0.5572584	–0.5634547	+1834	–0.2417506	–0.2444383	+ 546
Nov. 1	0.7736927	0.7681346	1505	0.5696080	0.5757179	1816	0.2471074	0.2497577	532
2	0.7625181	0.7568436	1540	0.5817838	0.5878051	1797	0.2523889	0.2550009	517
3	0.7511117	0.7453229	1576	0.5937814	0.5997123	1777	0.2575933	0.2601659	503
4	0.7394775	0.7335760	1611	0.6055973	0.6114359	1757	0.2627187	0.2652515	488
5	–0.7276188	–0.7216064	–1646	–0.6172276	–0.6229721	+1737	–0.2677639	–0.2702559	+ 473
6	0.7155391	0.7094176	1682	0.6286690	0.6343177	1715	0.2727272	0.2751777	458
7	0.7032423	0.6970138	1716	0.6399178	0.6454690	1693	0.2776072	0.2800155	443
8	0.6907326	0.6843992	1750	0.6509708	0.6564228	1671	0.2824024	0.2847677	427
9	0.6780140	0.6715775	1784	0.6618245	0.6671755	1648	0.2871112	0.2894329	411
10	–0.6650902	–0.6585526	–1817	–0.6724755	–0.6777242	+1625	–0.2917324	–0.2940096	+ 395
11	0.6519651	0.6453283	1850	0 6829212	0.6880661	1601	0.2962644	0.2984967	379
12	0.6386425	0.6319083	1882	0.6931586	0.6981083	1577	0.3007062	0.3028929	363
13	0.6251261	0.6182964	1914	0.7031848	0.7081177	1551	0.3050565	0.3071967	348
14	0.6114197	0.6044966	1946	0.7129966	0.7178213	1525	0.3093135	0.3114067	331
15	–0.5975276	–0.5905131	–1978	–0.7225913	–0.7273063	+1499	–0.3134762	–0.3155219	+ 314

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov. 16	−0.5834535	−0.5763493	−2009	−0.7319660	−0.7365701	+1472	−0.3175435	−0.3195410	+ 297
17	0.5692010	0.5620089	2039	0.7411181	0.7456096	1444	0.3215141	0.3234628	280
18	0.5547738	0.5474961	2069	0.7500442	0.7544216	1416	0.3253867	0.3272858	262
19	0.5401763	0.5328149	2099	0.7587417	0.7630040	1388	0.3291599	0.3310088	245
20	0.5254124	0.5179693	2128	0.7672080	0.7713533	1359	0.3328325	0.3346308	227
21	−0.5104861	−0.5029632	−2157	−0.7754397	−0.7794668	+1329	−0.3364035	−0.3381504	+ 209
22	0.4954013	0.4878010	2185	0.7834343	0.7873418	1300	0.3398713	0.3415661	191
23	0.4801627	0.4724872	2213	0.7911889	0.7949752	1269	0.3432346	0.3448767	173
24	0.4647751	0.4570267	2240	0.7987003	0.8023639	1238	0.3464923	0.3480813	155
25	0.4492427	0.4414237	2267	0.8059657	0.8095055	1205	0.3496436	0.3511788	136
26	−0.4335701	−0.4256826	−2294	−0.8129829	−0.8163974	+1172	−0.3526869	−0.3541677	+ 117
27	0.4177620	0.4098091	2319	0.8197487	0.8230366	1139	0.3556211	0.3570471	99
28	0.4018242	0.3938082	2344	0.8262607	0.8294207	1106	0.3584455	0.3598161	80
29	0.3857615	0.3776848	2368	0.8325164	0.8355476	1071	0.3611587	0.3624734	61
30	0.3695790	0.3614447	2392	0.8385141	0.8414155	1036	0.3637600	0.3650185	42
Dec. 1	−0.3532823	−0.3450926	−2415	−0.8442515	−0.8470218	+1000	−0.3662485	−0.3674501	+ 23
2	0.3368762	0.3286338	2437	0.8497264	0.8523649	964	0.3686232	0.3697677	+ 4
3	0.3203663	0.3120743	2460	0.8549370	0.8574425	927	0.3708834	0.3719704	− 15
4	0.3037582	0.2954188	2481	0.8598815	0.8622538	890	0.3730285	0.3740576	34
5	0.2870569	0.2786733	2502	0.8645590	0.8667971	853	0.3750578	0.3760289	53
6	−0.2702684	−0.2618429	−2522	−0.8689682	−0.8710718	+ 815	−0.3769708	−0.3778835	− 73
7	0.2533977	0.2449333	2541	0.8731079	0.8750763	777	0.3787670	0.3796211	92
8	0.2364504	0.2279497	2560	0.8769769	0.8788095	738	0.3804458	0.3812410	112
9	0.2194317	0.2108969	2578	0.8805740	0.8822704	700	0.3820068	0.3827431	131
10	0.2023461	0.1937800	2596	0.8838986	0.8854584	660	0.3834497	0.3841267	151
11	−0.1851991	−0.1766042	−2612	−0.8869497	−0.8883724	+ 620	−0.3847740	−0.3853915	− 170
12	0.1679958	0.1593746	2628	0.8897267	0.8910122	579	0.3859792	0.3865371	190
13	0.1507411	0.1420961	2643	0.8922287	0.8933764	538	0.3870650	0.3875630	209
14	0.1334403	0.1247742	2657	0.8944551	0.8954649	496	0.3880310	0.3884692	229
15	0.1160985	0.1074137	2671	0.8964055	0.8972768	454	0.3888773	0.3892554	248
16	−0.0987204	−0.0900193	−2684	−0.8980790	−0.8988118	+ 411	−0.3896035	−0.3899215	− 268
17	0.0813110	0.0725961	2697	0 8994750	0.9000687	368	0.3902093	0.3904669	287
18	0.0638753	0.0551492	2708	0.9005928	0.9010472	325	0.3906941	0.3908911	307
19	0.0464186	0.0376841	2718	0.9014318	0.9017466	282	0.3910577	0.3911940	326
20	0.0289460	0.0202053	2728	0.9019914	0.9021661	238	0.3912999	0.3913754	346
21	−0.0114628	−0.0027191	−2736	−0.9022709	−0.9023057	+ 194	−0.3914205	−0.3914352	− 365
22	+0.0060251	+0.0147692	2744	0.9022701	0.9021642	150	0.3914195	0.3913733	385
23	0.0235126	0.0322547	2752	0.9019881	0.9017418	105	0.3912966	0.3911894	404
24	0.0409947	0.0497319	2758	0.9014252	0.9010382	59	0.3910517	0.3908835	424
25	0.0584657	0.0671951	2763	0.9005810	0.9000534	+ 14	0.3906847	0.3904555	443
26	0.0759195	0.0846383	2768	0.8994555	0.8987873	− 32	0.3901957	0.3899055	463
27	+0.0933506	+0.1020557	−2772	−0.8980488	−0.8972399	− 78	−0.3895849	−0.3892339	− 482
28	0.1107528	0.1194414	2775	0.8963609	0.8954117	124	0.3888524	0.3884405	502
29	0.1281208	0.1367901	2776	0.8943925	0.8933034	171	0.3879982	0.3875257	521
30	0.1454486	0.1540958	2777	0.8921444	0.8909153	218	0.3870229	0.3864897	541
31	0.1627308	0.1713527	2776	0.8896169	0.8882488	265	0.3859263	0.3853329	560
32	+0.1799608	+0.1885546	−2775	−0.8868114	−0.8853047	− 312	−0.3847094	−0.3840559	− 580

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		FEBRUARY.		MARCH.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	190° 24′ 40″.0	−3° 13′ 14″.0	234° 9′ 43″.9	+0° 41′ 10″.0	242° 22′ 11″.7	+1° 39′ 56″.1
1.5	196 19 42.9	2 47 24.6	240 19 43.7	1 13 13.9	248 30 44.4	2 10 23.2
2.0	202 15 47.7	2 19 42.5	246 34 43.5	1 44 49.9	254 43 59.6	2 39 41.0
2.5	208 13 35.0	1 50 21.5	252 55 18.8	2 15 34.9	261 2 35.7	3 7 27.3
3.0	214 13 44.5	1 19 36.5	259 22 0.8	2 45 4.2	267 27 9.0	3 33 18.5
3.5	220 16 54.9	−0 47 43.6	265 55 14.1	+3 12 51.2	273 58 11.5	+3 56 49.9
4.0	226 23 42.4	−0 15 0.4	272 35 16.2	3 38 27.9	280 36 10.0	4 17 35.6
4.5	232 34 40.6	+0 18 13.7	279 22 16.0	4 1 25.3	287 21 23.9	4 35 9.5
5.0	238 50 19.4	0 51 37.5	286 16 12.1	4 21 14.3	294 14 4.3	4 49 5.5
5.5	245 11 4.1	1 24 47.6	293 16 51.7	4 37 26.3	301 14 11.6	4 58 58.6
6.0	251 37 14.3	+1 57 18.5	300 23 50.7	+4 49 35.0	308 21 34.3	+5 4 26.0
6.5	258 9 3.5	2 28 43.1	307 36 33.3	4 57 17.4	315 35 48.5	5 5 8.6
7.0	264 46 37.7	2 58 32.3	314 54 12.9	5 0 15.1	322 56 16.7	5 0 52.2
7.5	271 29 55.1	3 26 16.3	322 15 53.1	4 58 16.2	330 22 8.9	4 51 29.5
8.0	278 18 45.8	3 51 24.8	329 40 30.8	4 51 15.7	337 52 23.9	4 37 1.0
8.5	285 12 51.3	+4 13 28.4	337 6 58.4	+4 39 16.8	345 25 51.4	+4 17 35.6
9.0	292 11 45.2	4 31 59.1	344 34 6.5	4 22 30.7	353 1 14.6	3 53 31.4
9.5	299 14 53.9	4 46 31.7	352 0 48.0	4 1 16.1	0 37 13.9	3 25 15.1
10.0	306 21 37.7	4 56 45.5	359 26 0.4	3 35 58.7	8 12 30.6	2 53 20.9
10.5	313 31 12.2	5 2 24.1	6 48 48.4	3 7 10.0	15 45 50.5	2 18 29.0
11.0	320 42 50.5	+5 3 17.2	14 8 25.6	+2 35 25.3	23 16 6.3	+1 41 23.8
11.5	327 55 45.1	4 59 21.0	21 24 15.0	2 1 22.5	30 42 20.4	1 2 51.3
12.0	335 9 9.9	4 50 37.9	28 35 50.0	1 25 40.8	38 3 46.3	+0 23 37.7
12.5	342 22 21.8	4 37 16.5	35 42 53.7	0 48 58.9	45 19 48.6	−0 15 32.8
13.0	349 34 42.4	4 19 31.8	42 45 17.6	+0 11 54.4	52 30 3.5	0 53 59.3
13.5	356 45 39.1	+3 57 43.3	49 43 0.7	−0 24 57.2	59 34 18.0	−1 31 5.0
14.0	3 54 45.9	3 32 15.6	56 36 7.9	1 1 2.9	66 32 28.2	2 6 17.7
14.5	11 1 42.6	3 3 36.5	63 24 48.7	1 35 52.6	73 24 38.6	2 39 10.3
15.0	18 6 15.5	2 32 16.6	70 9 15.5	2 8 59.3	80 10 59.7	3 9 20.1
15.5	25 8 16.1	1 58 47.9	76 49 42.5	2 39 58.7	86 51 47.0	3 36 28.9
16.0	32 7 40.4	+1 23 43.9	83 26 24.5	−3 8 30.0	93 27 19.6	−4 0 22.6
16.5	39 4 27.9	0 47 38.5	89 59 36.0	3 34 14.9	99 57 58.7	4 20 50.4
17.0	45 58 40.3	+0 11 5.0	96 29 30.6	3 56 58.1	106 24 6.6	4 37 44.8
17.5	52 50 20.3	−0 25 23.6	102 56 20.2	4 16 27.2	112 46 6.0	4 51 1.1
18.0	59 39 31.1	1 1 15.3	109 20 15.1	4 32 32.2	119 4 19.3	5 0 36.6
18.5	66 26 15.0	−1 35 59.8	115 41 23.9	−4 45 6.0	125 19 7.8	−5 6 31.2
19.0	73 10 33.1	2 9 8.6	121 59 53.3	4 54 4.0	131 30 51.6	5 8 46.6
19.5	79 52 24.7	2 40 15.5	128 15 48.5	4 59 24.3	137 39 49.3	5 7 26.2
20.0	86 31 47.5	3 8 56.7	134 29 13.7	5 1 7.5	143 46 18.0	5 2 35.1
20.5	93 8 37.0	3 34 51.0	140 40 12.4	4 59 16.5	149 50 33.5	4 54 20.2
21.0	99 42 47.3	−3 57 40.7	146 48 48.2	−4 53 56.4	155 52 50.2	−4 42 49.8
21.5	106 14 11.3	4 17 11.4	152 55 5.2	4 45 14.6	161 53 21.3	4 28 13.7
22.0	112 42 41.3	4 33 12.1	158 59 8.5	4 33 20.4	167 52 19.3	4 10 43.1
22.5	119 8 9.8	4 45 34.8	165 1 4.5	4 18 24.7	173 49 56.6	3 50 30.5
23.0	125 30 30.3	4 54 15.5	171 1 1.8	4 0 39.7	179 46 25.4	3 27 49.7
23.5	131 49 37.8	−4 59 13.5	176 59 11.7	−3 40 18.9	185 41 58.2	−3 2 55.6
24.0	138 5 29.7	5 0 30.7	182 55 47.9	3 17 36.8	191 36 48.1	2 36 4.0
24.5	144 18 6.4	4 58 11.8	188 51 6.9	2 52 48.6	197 31 9.7	2 7 31.4
25.0	150 27 31.8	4 52 23.9	194 45 28.7	2 26 10.0	203 25 18.5	1 37 35.2
25.5	156 33 53.1	4 43 16.2	200 39 16.3	1 57 57.1	209 19 31.9	1 6 33.3
26.0	162 37 21.9	−4 30 59.2	206 32 55.6	−1 28 26.3	215 14 9.3	−0 34 44.0
26.5	168 38 14.1	4 15 44.8	212 26 55.8	0 57 54.4	221 9 31.7	−0 2 25.9
27.0	174 36 49.1	3 57 45.6	218 21 49.0	−0 26 38.2	227 6 2.5	+0 30 1.9
27.5	180 33 30.6	3 37 15.1	224 18 9.6	+0 5 5.1	233 4 7.5	1 2 20.3
28.0	186 28 45.9	3 14 27.2	230 16 34.4	0 36 57.5	239 4 14.1	1 34 9.8
28.5	192 23 6.0	2 49 35.6	236 17 41.8	1 8 40.8	245 6 51.6	2 5 10.5
29.0	198 17 4.6	−2 22 54.8	242 22 11.7	+1 39 56.1	251 12 31.3	+2 35 2.3
29.5	204 11 18.4	1 54 39.6	248 30 44.4	2 10 23.2	257 21 45.7	3 3 24.7
30.0	210 6 26.3	1 25 4.8	254 43 59.6	2 39 41.0	263 35 7.7	3 29 56.8
30.5	216 3 9.0	0 54 25.8	261 2 35.7	3 7 27.3	269 53 10.1	3 54 17.2
31.0	222 2 8.0	−0 22 58.8	267 27 9.0	3 33 18.5	276 16 25.0	4 16 3.9
31.5	228 4 5.6	+0 8 59.2	273 58 11.5	+3 56 49.9	282 45 22.8	+4 34 54.7

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		MAY.		JUNE.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	289° 20′ 30″.6	+ 4° 50′ 27″.3	326° 11′ 1″.8	+ 5° 7′ 16″.5	19° 12′ 48″.2	+ 1° 57′ 13″.2
1.5	296 2 11.1	5 2 19.9	333 13 50.6	4 55 0.1	26 30 34.7	1 19 11.2
2.0	302 50 41.4	5 10 11.3	340 22 11.4	4 38 2.2	33 50 2.6	+ 0 39 43.5
2.5	309 46 11.1	5 13 42.0	347 35 47.7	4 16 28.5	41 10 32.4	− 0 0 27.9
3.0	316 48 40.9	5 12 35.3	354 54 14.3	3 50 31.4	48 31 20.3	0 40 38.9
3.5	323 58 1.3	+ 5 6 38.2	2 16 57.2	+ 3 20 30.2	55 51 38.7	− 1 20 4.5
4.0	331 13 51.6	4 55 42.7	9 43 13.9	2 46 51.2	63 10 38.1	1 58 1.6
4.5	338 35 39.2	4 39 47.1	17 12 13.9	2 10 8.3	70 27 28.1	2 33 49.6
5.0	346 2 40.0	4 18 57.1	24 43 0.5	1 31 1.5	77 41 19.8	3 6 51.9
5.5	353 33 58.6	3 53 27.2	32 14 31.3	0 50 15.6	84 51 27.2	3 36 37.4
6.0	1 8 30.5	+ 3 23 40.1	39 45 41.6	+ 0 8 39.1	91 57 8.9	− 4 2 41.3
6.5	8 45 4.0	2 50 7.1	47 15 26.2	− 0 32 58.3	98 57 49.6	4 24 44.9
7.0	16 22 23.1	2 13 27.0	54 42 41.3	1 13 47.6	105 53 1.4	4 42 36.3
7.5	23 59 10.6	1 34 24.6	62 6 27.9	1 53 2.4	112 42 24.0	4 56 9.3
8.0	31 34 11.5	0 53 48.9	69 25 52.1	2 30 1.0	119 25 45.8	5 5 23.2
8.5	39 6 15.7	+ 0 12 30.4	76 40 8.8	− 3 4 7.5	126 3 3.0	− 5 10 21.8
9.0	46 34 20.6	− 0 28 41.0	83 48 41.2	3 34 52.5	132 34 19.9	5 11 12.8
9.5	53 57 32.7	1 8 57.7	90 51 2.1	4 1 53.5	138 59 48.2	5 8 6.7
10.0	61 15 9.1	1 47 36.9	97 46 53.9	4 24 54.7	145 19 45.8	5 1 15.9
10.5	68 26 38.2	2 24 1.3	104 36 8.9	4 43 46.6	151 34 35.9	4 50 54.5
11.0	75 31 39.1	− 2 57 39.6	111 18 47.5	− 4 58 25.0	157 44 47.0	− 4 37 17.0
11.5	82 30 1.3	3 28 6.8	117 54 58.2	5 8 50.3	163 50 50.8	4 20 38.7
12.0	89 21 43.1	3 55 4.2	124 24 56.4	5 15 6.6	169 53 21.7	4 1 14.9
12.5	96 6 51.4	4 18 18.3	130 49 3.2	5 17 20.7	175 52 56.4	3 39 21.0
13.0	102 45 39.6	4 37 40.7	137 7 44.0	5 15 41.7	181 50 12.7	3 15 12.5
13.5	109 18 26.3	− 4 53 7.1	143 21 27.8	− 5 10 20.0	187 45 48.7	− 2 49 4.8
14.0	115 45 34.1	5 4 36.5	149 30 46.3	5 1 27.2	193 40 23.1	2 21 13.2
14.5	122 7 28.9	5 12 10.6	155 36 12.7	4 49 15.4	199 34 33.2	1 51 53.5
15.0	128 24 38.3	5 15 53.4	161 38 21.2	4 33 57.4	205 28 56.0	1 21 21.6
15.5	134 37 30.9	5 15 50.6	167 37 46.1	4 15 46.4	211 24 6.6	0 49 54.3
16.0	140 46 35.5	− 5 12 9.4	173 35 1.5	− 3 54 55.8	217 20 38.0	− 0 17 49.0
16.5	146 52 21.0	5 4 58.0	179 30 40.7	3 31 39.5	223 19 1.0	+ 0 14 36.3
17.0	152 55 15.3	4 54 25.7	185 25 15.7	3 6 11.8	229 19 43.7	0 47 2.3
17.5	158 55 45.3	4 40 42.8	191 19 17.3	2 38 47.7	235 23 11.0	1 19 8.9
18.0	164 54 16.8	4 24 0.4	197 13 14.5	2 9 42.6	241 29 44.4	1 50 34.9
18.5	170 51 13.8	− 4 4 30.4	203 7 34.5	− 1 39 12.8	247 39 41.5	+ 2 20 58.3
19.0	176 46 59.0	3 42 25.9	209 2 41.9	1 7 35.6	253 53 16.3	2 49 56.5
19.5	182 41 53.7	3 18 0.6	214 59 0.1	0 35 9.0	260 10 38.6	3 17 6.1
20.0	188 36 18.0	2 51 29.4	220 56 49.9	− 0 2 12.1	266 31 54.2	3 42 3.9
20.5	194 30 30.3	2 23 8.1	226 56 29.9	+ 0 30 55.3	272 57 5.0	4 4 27.0
21.0	200 24 48.5	− 1 53 13.3	232 58 17.0	+ 1 3 52.3	279 26 8.9	+ 4 23 53.5
21.5	206 19 29.2	1 22 2.7	239 2 25.7	1 36 17.3	285 59 0.5	4 40 2.9
22.0	212 14 48.9	0 49 54.7	245 9 9.1	2 7 48.2	292 35 31.4	4 52 36.5
22.5	218 11 3.5	− 0 17 8.5	251 18 38.4	2 38 2.7	299 15 30.8	5 1 18.3
23.0	224 8 28.8	+ 0 15 56.2	257 31 3.2	3 6 38.1	305 58 46.1	5 5 55.3
23.5	230 7 20.8	+ 0 48 58.8	263 46 31.8	+ 3 33 12.1	312 45 3.7	+ 5 6 18.2
24.0	236 7 56.0	1 21 38.7	270 5 11.9	3 57 22.8	319 34 9.6	5 2 21.0
24.5	242 10 31.1	1 53 34.7	276 27 9.8	4 18 49.2	326 25 50.0	4 54 2.5
25.0	248 15 24.0	2 24 25.7	282 52 31.2	4 37 11.3	333 19 51.6	4 41 25.4
25.5	254 22 53.3	2 53 50.5	289 21 21.6	4 52 10.6	340 16 2.3	4 24 36.8
26.0	260 33 18.0	+ 3 21 27.8	295 53 46.1	+ 5 3 30.4	347 14 11.4	+ 4 3 48.0
26.5	266 46 58.1	3 46 56.8	302 29 49.4	5 10 56.2	354 14 9.1	3 39 14.8
27.0	273 4 14.6	4 9 56.7	309 9 35.8	5 14 15.6	1 15 46.5	3 11 16.8
27.5	279 25 28.4	4 30 7.3	315 53 9.0	5 13 19.2	8 18 55.4	2 40 17.8
28.0	285 51 0.2	4 47 9.1	322 40 32.0	5 8 0.7	15 23 27.3	2 6 45.4
28.5	292 21 10.4	5 0 43.1	329 31 46.6	4 58 17.0	22 29 13.3	1 31 10.0
29.0	298 56 17.6	+ 5 10 31.7	336 26 52.9	+ 4 44 9.1	29 36 2.5	+ 0 54 4.7
29.5	305 36 38.6	5 16 18.4	343 25 49.1	4 25 42.0	36 43 42.1	+ 0 16 5.5
30.0	312 22 27.4	5 17 48.8	350 28 30.2	4 3 5.4	43 51 56.2	− 0 22 10.4
30.5	319 13 53.6	5 14 51.1	357 34 47.7	3 36 33.9	51 0 25.7	1 0 4.8
31.0	326 11 1.8	5 7 16.5	4 44 29.1	3 6 27.1	58 8 47.7	1 36 59.5
31.5	333 13 50.6	+ 4 55 0.1	11 57 16.8	+ 2 33 10.1	65 16 35.7	− 2 12 17.6

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		AUGUST.		SEPTEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	58° 8′ 47″.7	− 1° 36′ 59″.5	109° 37′ 49″.6	− 4° 47′ 26″.6	157° 36′ 22″.0	− 4° 13′ 53″.8
1.5	65 16 35.7	2 12 17.6	116 19 49.7	4 55 45.3	163 47 54.7	3 54 1.8
2.0	72 23 19.8	2 45 24.0	122 58 24.7	4 59 57.7	169 56 23.1	3 31 33.8
2.5	79 28 27.7	3 15 46.6	129 33 19.3	5 0 6.8	176 1 55.3	3 6 48.7
3.0	86 31 25.6	3 42 57.6	136 4 20.7	4 56 19.4	182 4 42.3	2 40 5.5
3.5	93 31 38.6	− 4 6 33.6	142 31 19.4	− 4 48 45.3	188 4 58.3	− 2 11 43.6
4.0	100 28 34.2	4 26 16.6	148 54 10.3	4 37 37.3	194 3 0.8	1 42 2.4
4.5	107 21 40.1	4 41 54.1	155 12 52.8	4 23 10.2	199 59 10.6	1 11 21.1
5.0	114 10 29.6	4 53 18.8	161 27 31.5	4 5 40.7	205 53 51.7	0 39 58.6
5.5	120 54 39.7	5 0 28.9	167 38 15.5	3 45 26.2	211 47 31.0	− 0 8 13.5
6.0	127 33 53.3	− 5 3 27.4	173 45 19.2	− 3 22 45.1	217 40 38.4	+ 0 23 36.0
6.5	134 7 59.9	5 2 21.1	179 49 1.4	2 57 56.0	223 33 46.3	0 55 12.2
7.0	140 36 55.5	4 57 20.3	185 49 45.6	2 31 17.6	229 27 29.3	1 26 17.6
7.5	147 0 42.9	4 48 38.0	191 47 59.0	2 3 7.9	235 22 24.1	1 56 34.7
8.0	153 19 31.4	4 36 29.1	197 44 12.6	1 33 45.0	241 19 8.7	2 25 46.0
8.5	159 33 36.4	− 4 21 9.7	203 39 0.4	− 1 3 26.7	247 18 22.3	+ 2 53 34.0
9.0	165 43 19.0	4 2 56.8	209 32 59.0	0 32 30.2	253 20 44.2	3 19 40.8
9.5	171 49 5.2	3 42 7.5	215 26 47.1	− 0 1 12.5	259 26 53.6	3 43 48.0
10.0	177 51 24.9	3 18 59.1	221 21 4.7	+ 0 30 9.4	265 37 28.6	4 5 36.7
10.5	183 50 51.7	2 53 48.6	227 16 32.8	1 1 18.2	271 53 5.4	4 24 47.6
11.0	189 48 2.1	− 2 26 52.9	233 13 53.0	+ 1 31 56.6	278 14 17.1	+ 4 41 1.1
11.5	195 43 34.6	1 58 28.6	239 13 46.2	2 1 46.8	284 41 32.3	4 53 57.2
12.0	201 38 8.9	1 28 52.1	245 16 52.3	2 30 30.1	291 15 15.0	5 3 16.5
12.5	207 32 25.4	0 58 19.8	251 23 49.7	2 57 47.2	297 55 41.8	5 8 40.5
13.0	213 27 5.3	− 0 27 8.3	257 35 14.0	3 23 17.9	304 43 1.7	5 9 52.0
13.5	219 22 48.7	+ 0 4 25.7	263 51 36.8	+ 3 46 41.4	311 37 14.4	+ 5 6 37.0
14.0	225 20 15.1	0 36 4.7	270 13 25.4	4 7 36.0	318 38 9.5	4 58 44.7
14.5	231 20 2.2	1 7 30.5	276 41 1.3	4 25 39.5	325 45 26.2	4 46 9.6
15.0	237 22 45.2	1 38 24.3	283 14 39.2	4 40 30.1	332 58 33.0	4 28 52.1
15.5	243 28 56.5	2 8 26.2	289 54 26.2	4 51 46.5	340 16 48.3	4 6 59.6
16.0	249 39 5.1	+ 2 37 15.2	296 40 21.1	+ 4 59 9.2	347 39 21.6	+ 3 40 46.9
16.5	255 53 35.2	3 4 29.5	303 32 13.3	5 2 20.8	355 5 15.1	3 10 37.0
17.0	262 12 45.9	3 29 46.4	310 29 43.7	5 1 7.4	2 33 26.2	2 37 0.2
17.5	268 36 51.4	3 52 42.9	317 32 23.9	4 55 19.8	10 2 49.3	2 0 33.2
18.0	275 5 59.0	4 12 56.0	324 39 37.9	4 44 54.1	17 32 19.4	1 21 58.1
18.5	281 40 9.8	+ 4 30 3.0	331 50 42.7	+ 4 29 52.6	25 0 53.9	+ 0 42 0.5
19.0	288 19 18.0	4 43 42.6	339 4 50.6	4 10 24.5	32 27 35.0	+ 0 1 27.6
19.5	295 3 11.6	4 53 35.6	346 21 10.8	3 46 45.5	39 51 31.8	− 0 38 54.0
20.0	301 51 32.4	4 59 25.5	353 38 51.2	3 19 18.0	47 12 1.2	1 18 19.6
20.5	308 43 56.6	5 0 59.4	0 57 1.7	2 48 30.3	54 28 28.0	1 56 8.0
21.0	315 39 56.1	+ 4 58 8.8	8 14 54.8	+ 2 14 55.4	61 40 26.0	− 2 31 42.5
21.5	322 38 59.6	4 50 50.0	15 31 48.2	1 39 10.1	68 47 37.4	3 4 31.9
22.0	329 40 33.6	4 39 4.9	22 47 4.9	1 1 53.6	75 49 51.1	3 34 10.1
22.5	336 44 4.7	4 23 0.6	30 0 14.7	+ 0 23 45.8	82 47 3.1	4 0 16.4
23.0	343 49 0.4	4 2 49.8	37 10 54.0	− 0 14 33.3	89 39 14.7	4 22 35.3
23.5	350 54 50.1	+ 3 38 50.1	44 18 45.4	− 0 52 25.2	96 26 31.7	− 4 40 55.9
24.0	358 1 6.5	3 11 24.1	51 23 36.9	1 29 13.3	103 9 2.8	4 55 11.7
24.5	5 7 26.1	2 40 58.2	58 25 21.5	2 4 24.1	109 46 59.5	5 5 19.5
25.0	12 13 29.5	2 8 2.1	65 23 56.0	2 37 27.1	116 20 34.5	5 11 20.0
25.5	19 19 1.0	1 33 8.1	72 19 19.8	3 7 55.2	122 50 1.6	5 13 16.4
26.0	26 23 48.8	+ 0 56 50.3	79 11 33.7	− 3 35 25.0	129 15 34.9	− 5 11 14.4
26.5	33 27 43.8	+ 0 19 44.0	86 0 39.9	3 59 37.0	135 37 28.2	5 5 22.3
27.0	40 30 39.1	− 0 17 35.4	92 46 40.5	4 20 15.0	141 55 55.0	4 55 50.2
27.5	47 32 29.1	0 54 32.5	99 29 37.0	4 37 7.0	148 11 8.4	4 42 50.0
28.0	54 33 8.4	1 30 32.8	106 9 30.2	4 50 4.2	154 23 21.0	4 26 35.2
28.5	61 32 30.9	2 5 3.4	112 46 20.2	4 59 1.4	160 32 44.3	4 7 20.7
29.0	68 30 29.3	− 2 37 33.2	119 20 5.9	− 5 3 57.0	166 39 30.5	− 3 45 23.0
29.5	75 26 54.4	3 7 33.6	125 50 45.5	5 4 52.6	172 43 50.6	3 20 59.1
30.0	82 21 34.8	3 34 39.0	132 18 16.5	5 1 53.0	178 45 56.6	2 54 27.3
30.5	89 14 17.0	3 58 27.2	138 42 36.7	4 55 5.7	184 46 0.6	2 26 6.5
31.0	96 4 45.2	4 18 40.0	145 3 44.8	4 44 41.4	190 44 15.2	1 56 16.0
31.5	102 52 42.1	− 4 35 3.0	151 21 39.6	− 4 30 52.5	196 40 54.4	− 1 25 15.6

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		NOVEMBER.		DECEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	190° 44′ 15.″2	− 1° 56′ 16.″0	234° 57′ 53.″2	+ 2° 2′ 32.″5	268° 0′ 6.″2	+ 4° 18′ 15.″6
1.5	196 40 54.4	1 25 15.6	240 53 25.4	2 32 11.9	274 8 41.9	4 35 12.6
2.0	202 36 13.4	0 53 24.8	246 50 10.6	3 0 17.6	280 19 52.9	4 49 2.8
2.5	208 30 28.7	− 0 21 3.6	252 48 26.7	3 26 31.6	286 33 48.1	4 59 33.2
3.0	214 23 58.5	+ 0 11 28.7	258 48 33.0	3 50 36.7	292 50 36.9	5 6 32.0
3.5	220 17 2.9	+ 0 43 52.7	264 50 49.8	+ 4 12 16.1	299 10 29.3	+ 5 9 49.9
4.0	226 10 4.0	1 15 49.6	270 55 38.5	4 31 13.9	305 33 36.4	5 9 19.1
4.5	232 3 25.9	1 47 0.8	277 3 21.8	4 47 14.9	312 0 10.4	5 4 54.2
5.0	237 57 34.7	2 17 8.3	283 14 23.5	5 0 4.7	318 30 24.2	4 56 32.0
5.5	243 52 58.5	2 45 54.4	289 29 8.2	5 9 29.7	325 4 31.3	4 44 12.2
6.0	249 50 7.3	+ 3 13 1.6	295 48 0.8	+ 5 15 17.6	331 42 45.7	+ 4 27 56.7
6.5	255 49 32.4	3 38 12.7	302 11 26.6	5 17 16.7	338 25 21.2	4 7 50.9
7.0	261 51 46.6	4 1 10.6	308 39 49.9	5 15 17.6	345 12 30.3	3 44 3.5
7.5	267 57 23.8	4 21 38.5	315 13 33.7	5 9 11.8	352 4 23.8	3 16 46.9
8.0	274 6 58.2	4 39 19.4	321 52 58.8	4 58 53.4	359 1 9.6	2 46 17.9
8.5	280 21 3.6	+ 4 53 56.4	328 38 22.9	+ 4 44 19.5	6 2 51.3	+ 2 12 57.5
9.0	286 40 12.9	5 5 13.1	335 29 58.9	4 25 30.3	13 9 27.5	1 37 11.4
9.5	293 4 56.8	5 12 53.0	342 27 54.0	4 2 30.6	20 20 49.9	0 59 30.4
10.0	299 35 43.5	5 16 40.7	349 32 8.6	3 35 30.1	27 36 42.6	+ 0 20 29.6
10.5	306 12 57.1	5 16 22.1	356 42 34.8	3 4 44.4	34 56 41.0	− 0 19 11.4
11.0	312 56 55.8	+ 5 11 44.6	363 58 55.4	+ 2 30 35.5	42 20 11.4	− 0 58 49.7
11.5	319 47 51.1	5 2 38.4	11 20 43.2	1 53 32.2	49 46 31.0	1 37 40.5
12.0	326 45 46.9	4 48 57.6	18 47 20.6	1 14 9.9	57 14 48.0	2 14 57.9
12.5	333 50 37.4	4 30 40.9	26 18 0.0	+ 0 33 10.3	64 44 3.6	2 49 57.6
13.0	341 2 6.6	4 7 52.7	33 51 44.0	− 0 8 39.8	72 13 13.1	3 21 58.3
13.5	348 19 47.8	+ 3 40 44.4	41 27 27.4	− 0 50 30.2	79 41 9.1	− 3 50 23.5
14.0	355 43 3.0	3 9 35.0	49 3 59.5	1 31 29.5	87 6 43.5	4 14 43.0
14.5	3 11 4.1	2 34 51.3	56 40 5.8	2 10 47.2	94 28 51.0	4 34 34.3
15.0	10 42 53.3	1 57 7.7	64 14 31.8	2 47 35.8	101 46 31.7	4 49 42.8
15.5	18 17 25.7	1 17 5.8	71 46 5.3	3 21 13.6	108 58 53.3	5 0 1.6
16.0	25 53 30.9	+ 0 35 32.7	79 13 39.8	− 3 51 5.3	116 5 13.2	− 5 5 31.6
16.5	33 29 55.3	− 0 6 41.1	86 36 15.7	4 16 44.0	123 4 59.8	5 6 20.0
17.0	41 5 26.2	0 48 43.5	93 53 4.7	4 37 50.9	129 57 52.8	5 2 39.3
17.5	48 38 53.0	1 29 43.4	101 3 28.6	4 54 15.3	136 43 43.1	4 54 46.1
18.0	56 9 11.7	2 8 53.0	108 7 1.1	5 5 53.8	143 22 32.1	4 43 0.0
18.5	63 35 24.5	− 2 45 29.4	115 3 26.8	− 5 12 49.5	149 54 30.8	− 4 27 42.1
19.0	70 56 43.4	3 18 56.2	121 52 41.8	5 15 10.5	156 19 58.4	4 9 14.3
19.5	78 12 30.4	3 48 44.0	128 34 51.5	5 13 9.0	162 39 21.3	3 47 59.1
20.0	85 22 17.5	4 14 30.7	135 10 9.7	5 6 59.9	168 53 11.0	3 24 18.0
20.5	92 25 46.9	4 36 1.4	141 38 57.2	4 57 0.2	175 2 3.0	2 58 32.1
21.0	99 22 50.2	− 4 53 7.5	148 1 40.6	− 4 43 28.0	181 6 36.1	− 2 31 2.0
21.5	106 13 27.6	5 5 45.9	154 18 50.3	4 26 41.8	187 7 30.9	2 2 7.0
22.0	112 57 46.2	5 13 58.3	160 30 59.7	4 7 0.1	193 5 28.7	1 32 6.0
22.5	119 35 59.3	5 17 50.2	166 38 43.9	3 44 41.8	199 1 11.0	1 1 16.9
23.0	126 8 24.9	5 17 30.1	172 42 39.5	3 20 5.5	204 55 18.7	− 0 29 57.5
23.5	132 35 24.5	− 5 13 8.7	178 43 22.3	− 2 53 29.2	210 48 31.5	+ 0 1 34.9
24.0	138 57 22.4	5 4 58.6	184 41 28.1	2 25 11.1	216 41 27.3	0 33 2.8
24.5	145 14 44.2	4 53 13.6	190 37 31.4	1 55 29.1	222 34 41.6	1 4 9.1
25.0	151 27 56.6	4 38 8.4	196 32 4.9	1 24 41.0	228 28 47.4	1 34 36.1
25.5	157 37 26.1	4 19 58.7	202 25 39.7	0 53 5.0	234 24 14.9	2 4 5.9
26.0	163 43 39.3	− 3 59 0.7	208 18 44.6	− 0 20 59.3	240 21 30.7	+ 2 32 20.7
26.5	169 47 1.3	3 35 31.1	214 11 45.9	+ 0 11 17.7	246 20 57.8	2 59 2.0
27.0	175 47 56.7	3 9 47.1	220 5 7.8	0 43 27.3	252 22 55.8	3 23 51.5
27.5	181 46 48.6	2 42 6.5	225 59 11.9	1 15 10.4	258 27 40.4	3 46 30.9
28.0	187 43 59.0	2 12 47.5	231 54 17.5	1 46 8.1	264 35 23.4	4 6 42.3
28.5	193 39 48.2	1 42 8.8	237 50 41.6	2 16 1.0	270 46 12.9	4 24 8.4
29.0	199 34 35.6	− 1 10 29.4	243 48 39.3	+ 2 44 30.0	277 0 13.8	+ 4 38 33.0
29.5	205 28 39.5	0 38 8.5	249 48 23.7	3 11 16.2	283 17 27.6	4 49 41.3
30.0	211 22 16.9	− 0 5 25.8	255 50 6.2	3 36 0.9	289 37 53.3	4 57 20.3
30.5	217 15 44.9	+ 0 27 19.4	261 53 57.2	3 58 26.4	296 1 27.6	5 1 19.2
31.0	223 9 19.4	0 59 47.1	268 0 6.2	4 18 15.6	302 28 5.7	5 1 29.7
31.5	229 3 16.8	+ 1 31 37.9	274 8 41.9	+ 4 35 12.6	308 57 42.2	+ 4 57 46.7

FOR GREENWICH MEAN NOON.				
	THE MOON'S EQUATOR.			
Date.	*i* Inclination to Earth's Equator.	△ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic.	☊′ Ascend'g Node on Earth's Equator.	☾ Mean Longitude of the Moon.
	° ′	° ′	° ′	° ′
Jan. 0	24 28.2	45 33.0	2 38.9	178 11.8
10	24 28.8	45 2.5	2 37.5	309 57.6
20	24 29.3	44 32.0	2 36.1	81 43.5
30	24 29.9	44 1.6	2 34.6	213 29.3
Feb. 9	24 30.4	43 31.1	2 33.2	345 15.1
19	24 31.0	43 0.6	2 31.8	117 1.0
March 1	24 31.5	42 30.2	2 30.3	248 46.8
11	24 32.1	41 59.8	2 28.9	20 32.7
21	24 32.6	41 29.3	2 27.4	152 18.5
31	24 33.2	40 58.9	2 26.0	284 4.3
April 10	24 33.7	40 28.5	2 24.5	55 50.2
20	24 34.2	39 58.1	2 23.0	187 36.0
30	24 34.7	39 27.8	2 21.4	319 21.9
May 10	24 35.2	38 57.4	2 19.9	91 7.7
20	24 35.7	38 27.1	2 18.3	222 53.5
30	24 36.2	37 56.7	2 16.8	354 39.4
June 9	24 36.7	37 26.4	2 15.2	126 25.2
19	24 37.2	36 56.1	2 13.6	258 11.1
29	24 37.7	36 25.7	2 12.1	29 56.9
July 9	24 38.2	35 55.4	2 10.5	161 42.7
19	24 38.7	35 25.1	2 8.9	293 28.6
29	24 39.2	34 54.8	2 7.3	65 14.4
Aug. 8	24 39.6	34 24.5	2 5.7	197 0.3
18	24 40.1	33 54.3	2 4.0	328 46.1
28	24 40.5	33 24.0	2 2.4	100 31.9
Sept. 7	24 41.0	32 53.7	2 0.8	232 17.8
17	24 41.4	32 23.5	1 59.1	4 3.6
27	24 41.9	31 53.2	1 57.4	135 49.5
Oct. 7	24 42.3	31 23.0	1 55.8	267 35.3
17	24 42.8	30 52.7	1 54.1	39 21.1
27	24 43.2	30 22.5	1 52.4	171 7.0
Nov. 6	24 43.6	29 52.3	1 50.7	302 52.8
16	24 44.0	29 22.1	1 49.0	74 38.7
26	24 44.3	28 51.9	1 47.2	206 24.5
Dec. 6	24 44.7	28 21.7	1 45.5	338 10.3
16	24 45.1	27 51.5	1 43.8	109 56.2
26	24 45.5	27 21.3	1 42.0	241 42.0
36	24 45.9	26 51.2	1 40.3	13 27.9

Mean Solar Days.	Motion of ☾.
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64
24	13 10.58

TABLE FOR THE LIBRATION OF THE MOON.

Argument, (☊—λ) or (☊—λ—180°).

☊ — λ	Δ λ	1/a	B		☊ — λ	Δ λ	1/a	B	
0°	0′.0	39	0° 0′.0	180°	46°	0′.6	56	1° 3′.9	134°
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85.	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					
	Δ λ	1/a	B	☊ — λ		Δ λ	1/a	B	☊ — λ

Δ λ has the sign of tan (λ — ☊)
a has the sign of cos (☊ — λ)
B has the sign of sin (☊ — λ)

FOR GREENWICH MEAN NOON.

Date.	Apparent Obliquity of the Ecliptic. (Hansen.)	Equation of Equinoxes		Precession of Equinoxes in Longitude.	The Sun's		Mean Longitude of Moon's Ascending Node.
		In Longitude.	In R. A.		Aberration.	Hor. Par.	
Jan. 0	23° 27′ 9″.27	+13″.49	+0s.825	0″.00	−20″.80	9″.00	227° 58′.7
10	9.28	13.77	0.842	1.38	20.79	9.00	227 26.9
20	9.34	13.94	0.853	2.75	20.77	8.99	226 55.1
30	9.45	13.97	0.854	4.13	20.74	8.98	226 23.4
Feb. 9	9.57	13.86	0.848	5.50	20.71	8.96	225 51.6
19	23 27 9.68	+13.60	+0.832	6.88	−20.67	8.94	225 19.8
March 1	9.73	13.20	0.807	8.26	20.63	8.92	224 48.0
11	9.75	12.71	0.777	9.63	20.57	8.90	224 16.3
21	9.70	12.17	0.744	11.01	20.51	8.87	223 44.5
31	9.59	11.63	0.711	12.38	20.45	8.85	223 12.7
April 10	23 27 9.42	+11.14	+0.681	13.76	−20.39	8.82	222 41.0
20	9.20	10.76	0.658	15.14	20.34	8.80	222 9.2
30	8.97	10.50	0.642	16.51	20.29	8.78	221 37.4
May 10	8.71	10.37	0.634	17.89	20.24	8.76	221 5.6
20	8.47	10.38	0.635	19.26	20.19	8.74	220 33.9
30	23 27 8.26	+10.51	+0.643	20.64	−20.16	8.72	220 2.1
June 9	8.09	10.74	0.657	22.02	20.13	8.71	219 30.3
19	7.97	11.01	0.673	23.39	20.11	8.71	218 58.6
29	7.93	11.28	0.690	24.77	20.11	8.70	218 26.8
July 9	7.94	11.52	0.705	26.14	20.10	8.70	217 55.0
19	23 27 8.00	+11.70	+0.716	27.52	−20.12	8.71	217 23.2
29	8.09	11.75	0.719	28.90	20.14	8.72	216 51.5
Aug. 8	8.20	11.68	0.714	30.27	20.17	8.73	216 19.7
18	8.32	11.48	0.702	31.65	20.20	8.75	215 47.9
28	8.41	11.15	0.682	33.02	20.24	8.77	215 16.2
Sept. 7	23 27 8.46	+10.70	+0.654	34.40	−20.29	8.79	214 44.4
17	8.46	10.18	0.623	35.78	20.35	8.81	214 12.6
27	8.39	9.62	0.588	37.15	20.41	8.84	213 40.8
Oct. 7	8.27	9.08	0.555	38.53	20.47	8.87	213 9.1
17	8.10	8.60	0.526	39.90	20.53	8.88	212 37.3
27	23 27 7.89	+ 8.23	+0.503	41.28	−20.59	8.91	212 5.5
Nov. 6	7.65	7.99	0.489	42.66	20.64	8.93	211 33.7
16	7.41	7.92	0.484	44.03	20.69	8.95	211 2.0
26	7.18	7.99	0.489	45.41	20.73	8.97	210 30.2
Dec. 6	7.00	8.17	0.500	46.78	20.76	8.98	209 58.4
16	23 27 6.88	+ 8.42	+0.515	48.16	−20.78	8.99	209 26.6
26	6.82	8.73	0.534	49.54	20.79	9.00	208 54.9
36	23 27 6.82	+ 9.02	+0.552	50.91	−20.79	9.00	208 23.1

Mean Obliquity, 1883.0,	23° 27′ 15″.98 (Hansen).		Daily Motion of ☊, −3′.177
Mean Obliquity, 1883.0,	23° 27′ 15″.66 (Peters).		
Precession for 1883.5	50″.2600	log 1.70122	
Precession in a Solar Day	0″.1376	log 9.13863	
Precession in a Sidereal Day	0″.1372	log 9.13744	
Sun's Mean Equatorial Horizontal Parallax	8″.848	log 0.94685	

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF PETERS AND STRUVE.

NOTATION.

τ, the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1882, December $30^d.985$ = 1883, January $0^d.0$ — $0^d.015$, Washington mean time),

α_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the sun's true longitude,

Ω, the longitude of the moon's ascending node,

ω, the obliquity of the ecliptic,

Γ, the longitude of the sun's perigee,

Γ', the longitude of the moon's perigee,

☾, the moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{array}{lll}
A = & \tau - 0.34247 \sin \Omega & - 0.00011 \sin (3 \odot - \Gamma) \\
& + 0.00410 \sin 2 \Omega & - 0.00005 \sin 2 (\odot - \Omega) \\
& - 0.02521 \sin 2 \odot & + 0.00010 \sin 2 (\odot - \Gamma') \\
& + 0.00293 \sin (\odot + 82^\circ\ 10') & + 0.00009 \sin (2 \Gamma' - \Omega) \\
& + 0.00025 \sin (2 \odot - \Omega) & + 0.00005 \cos \Gamma' \\
& - 0.00405 \sin 2\,\text{☾} & + 0.00004 \sin 2 \Gamma' \\
& + 0.00135 \sin (\text{☾} - \Gamma') &
\end{array}$$

$$\begin{array}{lll}
B = & - 9''.2238 \cos \Omega & - 0''.0027 \cos (3 \odot - \Gamma) \\
& + 0.0895 \cos 2 \Omega & + 0.0067 \cos (2 \odot - \Omega) \\
& - 0.5506 \cos 2 \odot & + 0.0024 \cos (2 \Gamma' - \Omega) \\
& - 0.0092 \cos (\odot + 280^\circ\ 55') & - 0.0023 \sin \Gamma' \\
& - 0.0886 \cos 2\,\text{☾} & + 0.0008 \cos 2 \Gamma'
\end{array}$$

$$C = - 20''.4451 \cos \omega \cos \odot$$

$$D = - 20.4451 \sin \odot$$

$$E = - 0.0462 \sin \Omega + 0''.0014 \sin 2 \Omega - 0''.0033 \sin 2 \odot$$

BESSEL'S *Star-Constants.*

$a = 3^s.07240 + 1^s.33690 \sin \alpha_0 \tan \delta_0$ = precession in right ascension

$b = \frac{1}{15} \cos \alpha_0 \tan \delta_0$

$c = \frac{1}{15} \cos \alpha_0 \sec \delta_0$

$d = \frac{1}{15} \sin \alpha_0 \sec \delta_0$

$a' = 20''.0535 \cos \alpha_0$ = precession in declination

$b' = - \sin \alpha_0$

$c' = \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0$

$d' = \cos \alpha_0 \sin \delta_0$

Reduction to Apparent Position.

$\alpha = \alpha_0 + \tau \mu + A a + B b + C c + D d + E$ (in time)

$\delta = \delta_0 + \tau \mu' + A a' + B b' + C c' + D d'$ (in arc)

INDEPENDENT STAR-NUMBERS.

$f = 46''.0860\ A + E$ (in arc) $= 3^s.07240\ A + \frac{1}{15} E$ (in time)

$g \sin G = B$ $h \sin H = C$ $i = C \tan \omega$

$g \cos G = 20''.0535\ A$ $h \cos H = D$

Reduction to Apparent Position.

$\alpha = \alpha_0 + f + \tau \mu + \frac{1}{15} g \sin (G + \alpha) \tan \delta + \frac{1}{15} h \sin (H + \alpha) \sec \delta$ (in time)

$\delta = \delta_0 + \tau \mu' + g \cos (G + \alpha) + h \cos (H + \alpha) \sin \delta + i \cos \delta$ (in arc)

NOTES.—(1) When only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy, the independent star-numbers are more convenient. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, must be changed to $c, d, a, b, -c', -d', -a', -b'$, respectively.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Jan. 0	+ 9.4278	+ 0.8206	− 0.5338	+ 1.3032	Feb. 15	+ 9.6023	+ 0.8002	− 1.1978	+ 1.0440
1	9.4302	0.8218	0.5735	1.3017	16	9.6066	0.8003	1.2027	1.0319
2	9.4335	0.8238	0.6098	1.3001	17	9.6109	0.7991	1.2074	1.0193
3	9.4380	0.8262	0.6431	1.2983	18	9.6147	0.7968	1.2118	1.0062
4	9.4439	0.8285	0.6739	1.2964	($10^{h}.0$) 19	9.6178	0.7937	1.2160	0.9925
($7^{h}.0$) 5	+ 9.4509	+ 0.8302	− 0.7026	+ 1.2943	20	+ 9.6199	+ 0.7901	− 1.2201	+ 0.9782
6	9.4585	0.8308	0.7293	1.2921	21	9.6210	0.7868	1.2240	0.9634
7	9.4662	0.8302	0.7543	1.2897	22	9.6214	0.7842	1.2278	0.9480
8	9.4734	0.8285	0.7780	1.2871	23	9.6213	0.7828	1.2314	0.9318
9	9.4798	0.8258	0.8003	1.2844	24	9.6211	0.7828	1.2348	0.9148
10	+ 9.4849	+ 0.8228	− 0.8213	+ 1.2816	25	+ 9.6213	+ 0.7840	− 1.2381	+ 0.8970
11	9.4889	0.8199	0.8412	1.2786	26	9.6221	0.7860	1.2412	0.8784
12	9.4919	0.8176	0.8601	1.2755	27	9.6238	0.7884	1.2441	0.8588
13	9.4943	0.8164	0.8781	1.2722	28	9.6264	0.7904	1.2469	0.8381
14	9.4966	0.8163	0.8952	1.2687	Mar. 1	9.6296	0.7917	1.2496	0.8163
15	+ 9.4994	+ 0.8174	− 0.9116	+ 1.2650	2	+ 9.6332	+ 0.7918	− 1.2521	+ 0.7932
16	9.5029	0.8191	0.9272	1.2612	3	9.6368	0.7907	1.2544	0.7686
17	9.5074	0.8211	0.9422	1.2572	4	9.6401	0.7885	1.2566	0.7421
18	9.5129	0.8228	0.9565	1.2530	5	9.6426	0.7855	1.2587	0.7145
19	9.5190	0.8237	0.9702	1.2487	($11^{h}.0$) 6	9.6444	0.7824	1.2606	0.6845
($8^{h}.0$) 20	+ 9.5254	+ 0.8235	− 0.9833	+ 1.2442	7	+ 9.6454	+ 0.7797	− 1.2624	+ 0.6521
21	9.5315	0.8221	0.9960	1.2395	8	9.6458	0.7780	1.2640	0.6170
22	9.5369	0.8195	1.0081	1.2346	9	9.6460	0.7776	1.2655	0.5788
23	9.5412	0.8163	1.0198	1.2295	10	9.6462	0.7786	1.2669	0.5366
24	9.5444	0.8128	1.0311	1.2242	11	9.6469	0.7807	1.2681	0.4898
25	+ 9.5465	+ 0.8096	− 1.0419	+ 1.2188	12	+ 9.6483	+ 0.7835	− 1.2692	+ 0.4372
26	9.5477	0.8073	1.0523	1.2131	13	9.6505	0.7864	1.2701	0.3772
27	9.5485	0.8061	1.0623	1.2072	14	9.6533	0.7888	1.2709	0.3076
28	9.5494	0.8061	1.0720	1.2011	15	9.6566	0.7903	1.2716	0.2245
29	9.5508	0.8072	1.0814	1.1947	16	9.6600	0.7906	1.2722	0.1215
30	+ 9.5532	+ 0.8089	− 1.0904	+ 1.1881	17	+ 9.6632	+ 0.7897	− 1.2726	+ 9.9860
31	9.5565	0.8107	1.0990	1.1813	18	9.6657	0.7878	1.2729	9.7888
Feb. 1	9.5607	0.8120	1.1074	1.1742	19	9.6675	0.7853	1.2730	+ 9.4161
2	9.5656	0.8124	1.1155	1.1669	20	9.6684	0.7829	1.2731	− 8.9684
3	9.5708	0.8116	1.1233	1.1593	21	9.6686	0.7812	1.2730	9.6500
($9^{h}.0$) 4	+ 9.5757	+ 0.8096	− 1.1308	+ 1.1515	($12^{h}.0$) 22	+ 9.6683	+ 0.7805	− 1.2728	− 9.9036
5	9.5800	0.8065	1.1381	1.1434	23	9.6678	0.7812	1.2724	0.0622
6	9.5835	0.8029	1.1451	1.1350	24	9.6675	0.7833	1.2719	0.1779
7	9.5860	0.7993	1.1519	1.1262	25	9.6679	0.7863	1.2713	0.2695
8	9.5877	0.7963	1.1584	1.1172	26	9.6689	0.7898	1.2706	0.3448
9	+ 9.5888	+ 0.7942	− 1.1647	+ 1.1079	27	+ 9.6708	+ 0.7932	− 1.2697	− 0.4086
10	9.5897	0.7934	1.1708	1.0982	28	9.6734	0.7960	1.2687	0.4639
11	9.5908	0.7938	1.1766	1.0881	29	9.6764	0.7977	1.2675	0.5129
12	9.5025	0.7953	1.1822	1.0776	30	9.6795	0.7982	1.2662	0.5569
13	9.5950	0.7972	1.1876	1.0668	31	9.6825	0.7975	1.2648	0.5968
14	+ 9.5983	+ 0.7990	− 1.1928	+ 1.0556	32	+ 9.6849	+ 0.7960	− 1.2633	− 0.6329
15	+ 9.6023	+ 0.8002	− 1.1978	+ 1.0440	33	+ 9.6867	+ 0.7942	− 1.2616	− 0.6663

January 0 to January 14, $E = + 0''.04$ January 15 to October 2, $E = + 0''.03$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Apr. 1	+ 9.6849	+ 0.7960	− 1.2633	− 0.6329	May 17	+ 9.7642	+ 0.8536	− 1.0104	− 1.2336
2	9.6867	0.7942	1.2616	0.6663	18	9.7650	0.8565	0.9990	1.2383
3	9.6878	0.7926	1.2598	0.6971	19	9.7663	0.8601	0.9872	1.2428
4	9.6883	0.7918	1.2579	0.7258	20	9.7683	0.8638	0.9749	1.2471
5	9.6885	0.7922	1.2558	0.7526	21	9.7709	0.8672	0.9622	1.2513
(13^{h}.0) 6	+ 9.6888	+ 0.7939	− 1.2536	− 0.7777	(16^{h}.0) 22	+ 9.7740	+ 0.8698	− 0.9489	− 1.2553
7	9.6893	0.7968	1.2512	0.8012	23	9.7773	0.8714	0.9351	1.2591
8	9.6905	0.8005	1.2487	0.8234	24	9.7807	0.8720	0.9207	1.2628
9	9.6924	0.8045	1.2461	0.8444	25	9.7838	0.8715	0.9057	1.2663
10	9.6949	0.8081	1.2433	0.8643	26	9.7865	0.8705	0.8901	1.2697
11	+ 9.6980	+ 0.8110	− 1.2404	− 0.8832	27	+ 9.7886	+ 0.8692	− 0.8737	− 1.2730
12	9.7013	0.8128	1.2374	0.9012	28	9.7902	0.8684	0.8566	1.2761
13	9.7044	0.8133	1.2342	0.9184	29	9.7914	0.8682	0.8387	1.2790
14	9.7072	0.8128	1.2308	0.9347	30	9.7924	0.8691	0.8199	1.2818
15	9.7093	0.8117	1.2272	0.9503	31	9.7936	0.8710	0.8001	1.2845
16	+ 9.7107	+ 0.8104	− 1.2235	− 0.9653	June 1	+ 9.7951	+ 0.8737	− 0.7792	− 1.2870
17	9.7114	0.8095	1.2197	0.9796	2	9.7971	0.8769	0.7571	1.2894
18	9.7115	0.8095	1.2157	0.9934	3	9.7997	0.8801	0.7337	1.2917
19	9.7114	0.8107	1.2116	1.0066	4	9.8028	0.8828	0.7090	1.2938
20	9.7116	0.8131	1.2073	1.0192	5	9.8062	0.8847	0.6826	1.2958
(14^{h}.0) 21	+ 9.7119	+ 0.8166	− 1.2028	− 1.0314	(17^{h}.0) 6	+ 9.8097	+ 0.8856	− 0.6543	− 1.2977
22	9.7130	0.8207	1.1981	1.0431	7	9.8129	0.8854	0.6239	1.2994
23	9.7148	0.8248	1.1933	1.0544	8	9.8158	0.8843	0.5912	1.3010
24	9.7174	0.8284	1.1883	1.0653	9	9.8181	0.8828	0.5558	1.3024
25	9.7204	0.8311	1.1831	1.0758	10	9.8198	0.8813	0.5169	1.3038
26	+ 9.7237	+ 0.8327	− 1.1778	− 1.0859	11	+ 9.8210	+ 0.8802	− 0.4742	− 1.3050
27	9.7269	0.8331	1.1722	1.0956	12	9.8218	0.8600	0.4266	1.3061
28	9.7297	0.8326	1.1664	1.1050	13	9.8225	0.8807	0.3730	1.3071
29	9.7320	0.8316	1.1605	1.1141	14	9.8234	0.8825	0.3118	1.3079
30	9.7336	0.8306	1.1543	1.1229	15	9.8247	0.8849	0.2405	1.3087
May 1	+ 9.7347	+ 0.8302	− 1.1479	− 1.1314	16	+ 9.8265	+ 0.8877	− 0.1548	− 1.3093
2	9.7355	0.8308	1.1413	1.1395	17	9.8289	0.8903	0.0479	1.3098
3	9.7362	0.8325	1.1345	1.1474	18	9.8317	0.8923	9.9053	1.3102
4	9.7371	0.8353	1.1275	1.1551	19	9.8348	0.8934	9.6920	1.3104
5	9.7384	0.8390	1.1202	1.1625	20	9.8380	0.8934	− 9.2550	1.3106
(15^{h}.0) 6	+ 9.7404	+ 0.8430	− 1.1126	− 1.1696	(18^{h}.0) 21	+ 9.8410	+ 0.8924	+ 9.1209	− 1.3106
7	9.7431	0.8469	1.1048	1.1765	22	9.8436	0.8907	9.6474	1.3105
8	9.7462	0.8501	1.0968	1.1832	23	9.8458	0.8887	9.8785	1.3102
9	9.7497	0.8524	1.0884	1.1896	24	9.8474	0.8869	0.0284	1.3099
10	9.7532	0.8535	1.0798	1.1958	25	9.8487	0.8856	0.1396	1.3094
11	+ 9.7563	+ 0.8536	− 1.0709	− 1.2018	26	+ 9.8498	+ 0.8852	+ 0.2279	− 1.3088
12	9.7590	0.8529	1.0617	1.2076	27	9.8509	0.8858	0.3011	1.3081
13	9.7610	0.8519	1.0521	1.2132	28	9.8522	0.8873	0.3637	1.3073
14	9.7623	0.8511	1.0423	1.2186	29	9.8539	0.8894	0.4183	1.3063
15	9.7631	0.8510	1.0320	1.2238	30	9.8560	0.8917	0.4667	1.3052
16	+ 9.7637	+ 0.8517	− 1.0214	− 1.2288	31	+ 9.8587	+ 0.8937	+ 0.5101	− 1.3040
17	+ 9.7642	+ 0.8536	− 1.0104	− 1.2336	32	+ 9.8616	+ 0.8949	+ 0.5494	− 1.3027

$E = +\,0''.03$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log C_2	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
July 1	+ 9.8587	+ 0.8937	+ 0.5101	− 1.3040	Aug. 16	+ 9.9320	+ 0.8658	+ 1.1806	− 1.0806
2	9.8616	0.8949	0.5494	1.3027	17	9.9330	0.8627	1.1858	1.0704
3	9.8647	0.8952	0.5854	1.3012	18	9.9337	0.8599	1.1909	1.0598
4	9.8677	0.8944	0.6185	1.2996	19	9.9340	0.8580	1.1958	1.0489
5	9.8704	0.8927	0.6491	1.2979	20	9.9343	0.8571	1.2005	1.0375
($19^{h}.0$) 6	+ 9.8725	+ 0.8904	+ 0.6776	− 1.2961	($22^{h}.0$) 21	+ 9.9346	+ 0.8573	+ 1.2050	− 1.0257
7	9.8742	0.8880	0.7043	1.2941	22	9.9352	0.8585	1.2093	1.0134
8	9.8753	0.8858	0.7293	1.2920	23	9.9361	0.8602	1.2135	1.0006
9	9.8761	0.8844	0.7528	1.2898	24	9.9374	0.8619	1.2175	0.9874
10	9.8766	0.8839	0.7749	1.2875	25	9.9391	0.8632	1.2214	0.9736
11	+ 9.8773	+ 0.8844	+ 0.7959	− 1.2850	26	+ 9.9410	+ 0.8636	+ 1.2251	− 0.9592
12	9.8782	0.8858	0.8159	1.2824	27	9.9430	0.8631	1.2287	0.9441
13	9.8795	0.8876	0.8348	1.2796	28	9.9448	0.8614	1.2321	0.9284
14	9.8812	0.8894	0.8528	1.2767	29	9.9463	0.8590	1.2354	0.9119
15	9.8834	0.8908	0.8700	1.2737	30	9.9473	0.8561	1.2385	0.8946
16	+ 9.8860	+ 0.8913	+ 0.8865	− 1.2705	31	+ 9.9479	+ 0.8532	+ 1.2415	− 0.8765
17	9.8886	0.8909	0.9022	1.2672	Sept. 1	9.9481	0.8509	1.2443	0.8575
18	9.8912	0.8894	0.9172	1.2637	2	9.9480	0.8496	1.2470	0.8375
19	9.8935	0.8871	0.9317	1.2601	3	9.9479	0.8494	1.2496	0.8164
20	9.8954	0.8843	0.9455	1.2563	4	9.9478	0.8503	1.2520	0.7940
($20^{h}.0$) 21	+ 9.8968	+ 0.8815	+ 0.9588	− 1.2523	($23^{h}.0$) 5	+ 9.9481	+ 0.8520	+ 1.2543	− 0.7703
22	9.8978	0.8792	0.9716	1.2482	6	9.9487	0.8541	1.2564	0.7451
23	9.8986	0.8777	0.9839	1.2439	7	9.9497	0.8562	1.2584	0.7182
24	9.8993	0.8773	0.9958	1.2395	8	9.9511	0.8576	1.2603	0.6893
25	9.9001	0.8778	1.0073	1.2349	9	9.9526	0.8581	1.2621	0.6583
26	+ 9.9012	+ 0.8791	+ 1.0183	− 1.2302	10	+ 9.9542	+ 0.8575	+ 1.2637	− 0.6248
27	9.9027	0.8807	1.0289	1.2253	11	9.9557	0.8559	1.2652	0.5881
28	9.9047	0.8822	1.0392	1.2202	12	9.9570	0.8537	1.2665	0.5479
29	9.9070	0.8831	1.0491	1.2149	13	9.9578	0.8512	1.2678	0.5035
30	9.9095	0.8831	1.0587	1.2094	14	9.9583	0.8489	1.2689	0.4539
31	+ 9.9119	+ 0.8820	+ 1.0679	− 1.2037	15	+ 9.9585	+ 0.8473	+ 1.2698	− 0.3978
Aug. 1	9.9141	0.8800	1.0769	1.1978	16	9.9585	0.8468	1.2707	0.3331
2	9.9160	0.8772	1.0855	1.1917	17	9.9586	0.8475	1.2714	0.2565
3	9.9173	0.8741	1.0939	1.1854	18	9.9588	0.8492	1.2720	0.1639
4	9.9182	0.8712	1.1020	1.1789	19	9.9594	0.8516	1.2725	0.0453
5	+ 9.9186	+ 0.8690	+ 1.1098	− 1.1721	($0^{h}.0$) 20	+ 9.9603	+ 0.8542	+ 1.2728	− 9.8800
($21^{h}.0$) 6	9.9188	0.8677	1.1174	1.1651	21	9.9616	0.8566	1.2730	9.6114
7	9.9190	0.8674	1.1247	1.1579	22	9.9632	0.8582	1.2731	− 8.7784
8	9.9194	0.8682	1.1318	1.1505	23	9.9649	0.8589	1.2731	+ 9.4611
9	9.9201	0.8696	1.1386	1.1428	24	9.9665	0.8585	1.2729	9.8046
10	+ 9.9212	+ 0.8712	+ 1.1452	− 1.1348	25	+ 9.9679	+ 0.8572	+ 1.2726	+ 9.9943
11	9.9228	0.8725	1.1516	1.1265	26	9.9689	0.8553	1.2722	0.1258
12	9.9246	0.8730	1.1578	1.1180	27	9.9695	0.8533	1.2716	0.2266
13	9.9267	0.8726	1.1638	1.1090	28	9.9697	0.8517	1.2709	0.3084
14	9.9287	0.8712	1.1696	1.0999	29	9.9697	0.8510	1.2701	0.3772
15	+ 9.9305	+ 0.8688	+ 1.1752	− 1.0904	30	+ 9.9695	+ 0.8515	+ 1.2692	+ 0.4364
16	+ 9.9320	+ 0.8658	+ 1.1806	− 1.0806	31	+ 9.9693	+ 0.8530	+ 1.2681	+ 0.4884

$E = +\ 0''.03$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct. 1	+ 9.9693	+ 0.8530	+ 1.2681	+ 0.4884	Nov. 16	+ 0.0135	+ 0.9148	+ 1.0366	+ 1.2215
2	9.9693	0.8555	1.2669	0.5348	17	0.0155	0.9160	1.0257	1.2268
3	9.9697	0.8586	1.2656	0.5766	18	0.0174	0.9162	1.0143	1.2320
4	9.9705	0.8617	1.2641	0.6146	19	0.0190	0.9157	1.0025	1.2370
$(1^{h}.0)$ 5	9.9717	0.8643	1.2625	0.6495	$(4^{h}.0)$ 20	0.0204	0.9148	0.9902	1.2417
6	+ 9.9732	+ 0.8661	+ 1.2608	+ 0.6817	21	+ 0.0214	+ 0.9139	+ 0.9774	+ 1.2463
7	9.9747	0.8669	1.2589	0.7115	22	0.0220	0.9135	0.9640	1.2507
8	9.9762	0.8667	1.2569	0.7393	23	0.0224	0.9139	0.9501	1.2549
9	9.9775	0.8656	1.2547	0.7653	24	0.0228	0.9152	0.9356	1.2590
10	9.9785	0.8642	1.2524	0.7898	25	0.0233	0.9174	0.9205	1.2629
11	+ 9.9791	+ 0.8628	+ 1.2500	+ 0.8129	26	+ 0.0240	+ 0.9203	+ 0.9046	+ 1.2666
12	9.9794	0.8620	1.2474	0.8347	27	0.0251	0.9234	0.8880	1.2702
13	9.9795	0.8622	1.2446	0.8553	28	0.0265	0.9263	0.8706	1.2736
14	9.9797	0.8635	1.2417	0.8749	29	0.0283	0.9287	0.8523	1.2768
15	9.9799	0.8658	1.2387	0.8935	30	0.0302	0.9302	0.8331	1.2800
16	+ 9.9804	+ 0.8689	+ 1.2355	+ 0.9112	Dec. 1	+ 0.0321	+ 0.9307	+ 0.8129	+ 1.2828
17	9.9814	0.8724	1.2322	0.9281	2	0.0340	0.9304	0.7915	1.2855
18	9.9826	0.8757	1.2287	0.9443	3	0.0356	0.9294	0.7687	1.2881
19	9.9842	0.8784	1.2250	0.9598	4	0.0369	0.9282	0.7447	1.2906
20	9.9860	0.8803	1.2211	0.9746	$(5^{h}.0)$ 5	0.0379	0.9271	0.7192	1.2929
$(2^{h}.0)$ 21	+ 9.9878	+ 0.8811	+ 1.2171	+ 0.9888	6	+ 0.0387	+ 0.9266	+ 0.6918	+ 1.2951
22	9.9894	0.8809	1.2129	1.0025	7	0.0394	0.9269	0.6623	1.2971
23	9.9907	0.8801	1.2086	1.0156	8	0.0401	0.9281	0.6307	1.2990
24	9.9916	0.8790	1.2041	1.0282	9	0.0410	0.9301	0.5965	1.3007
25	9.9921	0.8782	1.1993	1.0403	10	0.0421	0.9327	0.5590	1.3023
26	+ 9.9923	+ 0.8781	+ 1.1944	+ 1.0520	11	+ 0.0436	+ 0.9353	+ 0.5179	+ 1.3038
27	9.9924	0.8789	1.1893	1.0632	12	0.0454	0.9376	0.4723	1.3051
28	9.9925	0.8808	1.1840	1.0741	13	0.0474	0.9392	0.4211	1.3062
29	9.9927	0.8836	1.1785	1.0845	14	0.0495	0.9400	0.3631	1.3073
30	9.9932	0.8870	1.1728	1.0946	15	0.0516	0.9397	0.2959	1.3082
31	+ 9.9941	+ 0.8906	+ 1.1669	+ 1.1043	16	+ 0.0534	+ 0.9387	+ 0.2161	+ 1.3089
Nov. 1	9.9954	0.8939	1.1608	1.1137	17	0.0550	0.9372	0.1176	1.3095
2	9.9970	0.8964	1.1544	1.1228	18	0.0561	0.9355	9.9903	1.3100
3	9.9987	0.8981	1.1478	1.1315	19	0.0570	0.9342	9.8096	1.3103
4	0.0005	0.8987	1.1410	1.1400	20	0.0576	0.9335	+ 9.4942	1.3105
$(3^{h}.0)$ 5	+ 0.0021	+ 0.8984	+ 1.1339	+ 1.1482	$(6^{h}.0)$ 21	+ 0.0581	+ 0.9336	− 8.3222	+ 1.3106
6	0.0034	0.8977	1.1265	1.1561	22	0.0587	0.9346	9.5490	1.3105
7	0.0044	0 8968	1.1189	1.1637	23	0.0594	0.9363	9.8370	1.3103
8	0.0051	0.8963	1.1110	1.1710	24	0.0604	0.9384	0.0086	1.3099
9	0.0055	0.8965	1.1029	1.1781	25	0.0618	0.9405	0.1313	1.3094
10	+ 0.0060	+ 0.8978	+ 1.0944	+ 1.1850	26	+ 0.0634	+ 0.9421	− 0.2268	+ 1.3088
11	0.0065	0.9000	1.0856	1.1916	27	0.0652	0.9429	0.3048	1.3080
12	0.0072	0.9029	1.0765	1.1980	28	0.0671	0.9429	0.3710	1.3071
13	0.0083	0.9063	1.0670	1.2042	29	0.0689	0.9419	0.4281	1.3061
14	0.0097	0.9097	1.0572	1.2102	30	0.0705	0.9402	0.4785	1.3049
15	+ 0.0115	+ 0.9127	+ 1.0471	+ 1.2159	31	+ 0.0718	+ 0.9381	− 0.5236	+ 1.3036
16	+ 0.0135	+ 0.9148	+ 1.0366	+ 1.2215	32	+ 0.0729	+ 0.9360	− 0.5643	+ 1.3021

$E = + 0''.02$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Jan. 0	0.0014	+12.38	+0.825	50 56	3 23.7	350 21	23 21.4	+0.9305	+1.3095	−1.48	−0.1709
1	0.0041	12.45	0.830	50 51	3 23.4	349 25	23 17.6	0.9321	1.3093	1.63	0.2107
2	0.0069	12.54	0.836	50 46	3 23.1	348 28	23 13.9	0.9347	1.3090	1.77	0.2471
3	0.0096	12.67	0.845	50 38	3 22.5	347 32	23 10.1	0.9380	1.3087	1.91	0.2805
4	0.0124	12.84	0.856	50 24	3 21.6	346 35	23 6.3	0.9417	1.3084	2.05	0.3113
(7^{h}.●) 5	0.0151	+13.05	+0.870	50 4	3 20.2	345 38	23 2.5	+0.9455	+1.3081	−2.19	−0.3400
6	0.0178	13.28	0.885	49 36	3 18.4	344 41	22 58.8	0.9491	1.3078	2.33	0.3668
7	0.0206	13.52	0.901	49 4	3 16.4	343 44	22 55.0	0.9520	1.3074	2.46	0.3919
8	0.0233	13.75	0.916	48 29	3 13.9	342 47	22 51.2	0.9542	1.3070	2.60	0.4154
9	0.0261	13.95	0.930	47 53	3 11.6	341 50	22 47.4	0.9555	1.3067	2.74	0.4377
10	0.0288	+14.11	+0.941	47 21	3 9.4	340 53	22 43.6	+0.9562	+1.3063	−2.88	−0.4587
11	0.0315	14.24	0.950	46 54	3 7.6	339 56	22 39.7	0.9565	1.3058	3.01	0.4786
12	0.0343	14.34	0.957	46 33	3 6.2	338 59	22 35.9	0.9567	1.3054	3.14	0.4976
13	0.0370	14.42	0.961	46 19	3 5.3	338 1	22 32.1	0.9572	1.3049	3.28	0.5155
14	0.0397	14.50	0.966	46 10	3 4.6	337 4	22 28.2	0.9582	1.3045	3.41	0.5327
15	0.0425	+14.59	+0.973	46 3	3 4.2	336 6	22 24.4	+0.9601	+1.3040	−3.54	−0.5491
16	0.0452	14.71	0.981	45 56	3 3.7	335 8	22 20.5	0.9627	1.3035	3.67	0.5647
17	0.0480	14.86	0.991	45 46	3 3.1	334 10	22 16.7	0.9659	1.3030	3.80	0.5796
18	0.0507	15.05	1.003	45 31	3 2.1	333 12	22 12.8	0.9695	1.3024	3.93	0.5939
19	0.0534	15.26	1.017	45 10	3 0.7	332 14	22 8.9	0.9730	1.3019	4.05	0.6076
(8^{h}.●) 20	0.0562	+15.49	+1.033	44 44	2 58.9	331 15	22 5.0	+0.9761	+1.3013	−4.18	−0.6208
21	0.0589	15.71	1.047	44 14	2 56.9	330 17	22 1.1	0.9785	1.3008	4.30	0.6334
22	0 0616	15.90	1.060	43 43	2 54.9	329 18	21 57.2	0.9800	1.3002	4.42	0.6456
23	0.0644	16.06	1.071	43 13	2 52.9	328 19	21 53.3	0.9808	1.2996	4.54	0.6573
24	0.0671	16.18	1.079	42 46	2 51.1	327 20	21 49.4	0.9809	1.2990	4.66	0.6685
25	0.0699	+16.26	+1.084	42 26	2 49.7	326 21	21 45.4	+0.9805	+1.2984	−4.78	−0.6794
26	0.0726	16.30	1.087	42 12	2 48.8	325 22	21 41.5	0.9801	1.2978	4.89	0.6897
27	0.0753	16.33	1.089	42 4	2 48.3	324 23	21 37.5	0.9801	1.2971	5.01	0.6998
28	0.0781	16.37	1.091	42 0	2 48.0	323 23	21 33.5	0.9806	1.2965	5.12	0.7094
29	0.0808	16.42	1.095	41 59	2 47.9	322 23	21 29.5	0.9818	1.2959	5.23	0.7188
30	0.0835	+16.51	+1.101	41 57	2 47.8	321 23	21 25.6	+0.9839	+1.2952	−5.34	−0.7279
31	0.0863	16.64	1.109	41 50	2 47.4	320 23	21 21.6	0.9865	1.2946	5.45	0.7366
Feb. 1	0.0890	16.80	1.120	41 39	2 46.6	319 23	21 17.6	0.9895	1.2939	5.56	0.7449
2	0.0918	16.99	1.133	41 21	2 45.4	318 23	21 13.5	0.9924	1.2933	5.66	0.7529
3	0.0945	17.19	1.146	40 58	2 43.9	317 22	21 9.5	0.9950	1.2926	5.76	0.7607
(9^{h}.●) 4	0.0972	+17.39	+1.159	40 31	2 42.0	316 22	21 5.4	+0.9969	+1.2919	−5.86	−0.7683
5	0.1000	17.56	1.171	40 2	2 40.1	315 21	21 1.4	0.9982	1.2913	5.96	0.7755
6	0.1027	17.70	1.180	39 34	2 38.3	314 20	20 57.3	0.9988	1.2906	6.06	0.7825
7	0.1055	17.81	1.187	39 10	2 36.7	313 19	20 53.2	0.9968	1.2899	6.16	0.7893
8	0.1082	17.88	1.192	38 52	2 35.5	312 17	20 49.2	0.9986	1.2893	6.25	0.7959
9	0.1109	+17.92	+1.195	38 40	2 34.7	311 16	20 45.1	+0.9985	+1.2886	−6.34	−0.8021
10	0.1137	17.96	1.197	38 33	2 34.2	310 14	20 40.9	0.9987	1.2880	6.43	0.8082
11	0.1164	18.00	1.200	38 31	2 34.1	309 12	20 36.8	0.9996	1.2873	6.52	0.8140
12	0.1191	18.07	1.205	38 30	2 34.0	308 10	20 32.7	1.0012	1.2867	6.60	0.8196
13	0.1219	18.18	1.212	38 28	2 33.8	307 8	20 28.5	1.0034	1.2860	6.68	0.8250
14	0.1246	+18.31	+1.221	38 22	2 33.5	306 6	20 24.4	+1.0061	+1.2854	−6.76	−0.8303
15	0.1274	+18.48	+1.232	38 11	2 32.7	305 3	20 20.2	+1.0090	+1 2848	−6.84	−0.8353

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Feb.	15	0.1274	+18.48	+1.232	38 11	2 32.7	305 3	20 20.2	+1.0090	+1.2848	−6.84	−0.8353
	16	0.1301	18.67	1.244	37 55	2 31.7	304 1	20 16.0	1.0118	1.2842	6.92	0.8401
	17	0.1328	18.85	1.257	37 34	2 30.3	302 58	20 11.9	1.0141	1.2836	6.99	0.8447
	18	0.1356	19.02	1.268	37 11	2 28.7	301 55	20 7.7	1.0156	1.2830	7.07	0.8492
(10^{h}.0)	19	0.1383	19.15	1.277	36 47	2 27.1	300 52	20 3.5	1.0164	1.2824	7.14	0.8535
	20	0.1410	+19.24	+1.283	36 26	2 25.7	299 49	19 59.2	+1.0165	+1.2818	−7.20	−0.8575
	21	0.1438	19.29	1.286	36 9	2 24.6	298 45	19 55.0	1.0161	1.2812	7.27	0.8615
	22	0.1465	19.31	1.287	35 58	2 23.8	297 42	19 50.8	1.0154	1.2807	7.33	0.8653
	23	0.1492	19.31	1.287	35 53	2 23.5	296 38	19 46.6	1.0149	1.2801	7.39	0.8689
	24	0.1520	19.30	1.286	35 53	2 23.6	295 35	19 42.3	1.0147	1.2796	7.45	0.8723
	25	0.1547	+19.31	+1.287	35 57	2 23.8	294 31	19 38.1	+1.0152	+1.2791	−7.51	−0.8755
	26	0.1575	19.34	1.289	36 2	2 24.1	293 27	19 33.8	1.0165	1.2786	7.56	0.8786
	27	0.1602	19.42	1.295	36 4	2 24 3	292 23	19 29.5	1.0184	1.2782	7.61	0.8816
	28	0.1629	19.53	1.302	36 2	2 24.1	291 19	19 25.2	1.0208	1.2777	7.66	0.8844
Mar.	1	0.1657	19.68	1.312	35 55	2 23.7	290 14	19 21.0	1.0234	1.2773	7.71	0.8871
	2	0.1684	+19.84	+1.323	35 42	2 22.8	289 10	19 16.7	+1.0258	+1.2769	−7.75	−0.8895
	3	0.1712	20.01	1.334	35 24	2 21.6	288 6	19 12.4	1.0278	1.2765	7.79	0.8919
	4	0.1739	20.16	1.344	35 4	2 20.2	287 1	19 8.1	1.0292	1.2761	7.83	0.8941
	5	0.1766	20.27	1.352	34 43	2 18.9	285 56	19 3.8	1.0300	1.2757	7.87	0.8962
(11^{h}.0)	6	0.1794	20.36	1.357	34 25	2 17.7	284 52	18 59.5	1.0301	1.2754	7.91	0.8981
	7	0.1821	+20.40	+1.360	34 12	2 16.8	283 47	18 55.1	+1.0299	+1.2751	−7.94	−0.8998
	8	0.1848	20.42	1.362	34 4	2 16.3	282 42	18 50.8	1.0297	1.2748	7.97	0.9015
	9	0.1876	20.43	1.362	34 2	2 16.1	281 37	18 46.5	1.0297	1.2745	8.00	0.9030
	10	0.1903	20.44	1.363	34 4	2 16.3	280 32	18 42.2	1.0302	1.2743	8.02	0.9043
	11	0.1931	20.48	1.365	34 9	2 16.6	279 28	18 37.8	1.0314	1.2740	8.04	0.9055
	12	0.1958	+20.54	+1.369	34 15	2 17.0	278 23	18 33.5	+1.0332	+1.2738	−8.06	−0.9066
	13	0.1985	20.64	1.376	34 17	2 17.2	277 17	18 29.2	1.0356	1.2737	8.08	0.9076
	14	0.2013	20.78	1.385	34 16	2 17.1	276 12	18 24.8	1.0383	1.2735	8.10	0.9084
	15	0.2040	20.94	1.396	34 9	2 16.6	275 7	18 20.5	1.0410	1.2734	8.11	0.9091
	16	0.2067	21.10	1.407	33 58	2 15.9	274 2	18 16.2	1.0434	1.2733	8.12	0.9096
	17	0.2095	+21.25	+1.417	33 43	2 14.9	272 57	18 11.8	+1.0453	+1.2732	−8.13	−0.9100
	18	0.2122	21.38	1.425	33 27	2 13.8	271 52	18 7.5	1.0465	1.2732	8.13	0.9103
	19	0.2150	21.46	1.431	33 11	2 12.8	270 47	18 3.2	1.0470	1.2731	8.14	0.9105
	20	0.2177	21.51	1.434	32 59	2 12.0	269 43	17 58 8	1.0470	1.2731	8.14	0.9106
	21	0.2204	21.52	1.435	32 52	2 11.5	268 38	17 54.5	1.0466	1.2731	8.14	0.9105
(12^{h}.0)	22	0.2232	+21.50	+1.434	32 51	2 11.4	267 33	17 50.2	+1.0461	+1.2732	−8.13	−0.9102
	23	0.2259	21.48	1.432	32 56	2 11.7	266 28	17 45.9	1.0460	1.2732	8.12	0.9098
	24	0.2287	21.47	1.431	33 4	2 12.2	265 24	17 41.6	1.0465	1.2733	8.12	0.9094
	25	0.2314	21.48	1.432	33 13	2 12.9	264 19	17 37.3	1.0476	1.2734	8.11	0.9088
	26	0.2341	21.53	1.435	33 22	2 13.5	263 14	17 32.9	1.0494	1.2736	8.09	0.9080
	27	0.2369	+21.63	+1.442	33 28	2 13.9	262 10	17 28.6	+1.0517	+1.2737	−8.08	−0.9072
	28	0.2396	21.76	1.450	33 29	2 13.9	261 5	17 24.4	1.0543	1.2739	8.06	0.9062
	29	0.2423	21.91	1.460	33 24	2 13.6	260 1	17 20.1	1.0570	1.2741	8.04	0.9050
	30	0.2451	22.07	1.471	33 14	2 13.0	258 57	17 15.8	1.0593	1.2744	8.01	0.9037
	31	0.2478	22.22	1.481	33 1	2 12.1	257 53	17 11.5	1.0612	1.2747	7.99	0.9023
	32	0.2506	+22.34	+1.489	32 47	2 11.1	256 49	17 7.3	+1.0625	+1.2749	−7.96	−0.9008
	33	0.2533	+22.43	+1.495	32 34	2 10.3	255 45	17 3.0	+1.0632	+1.2752	−7.93	−0.8991

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Apr.	1	0.2506	+22.34	+1.489	32 47	2 11.1	256 49	17 7.3	+1.0625	+1.2749	−7.96	−0.9008
	2	0.2533	22.43	1.495	32 34	2 10.3	255 45	17 3.0	1.0632	1.2752	7.93	0.8991
	3	0.2560	22.49	1.499	32 25	2 9.6	254 41	16 58.7	1.0635	1.2755	7.89	0.8973
	4	0.2588	22.51	1.501	32 20	2 9.3	253 38	16 54.5	1.0636	1.2759	7.86	0.8953
	5	0.2615	22.53	1.502	32 20	2 9.3	252 34	16 50.3	1.0639	1.2762	7.82	0.8933
h (13.0)	6	0.2642	+22.54	+1.503	32 25	2 9.7	251 31	16 46.1	+1.0646	+1.2766	−7.78	−0.8911
	7	0.2670	22.57	1.505	32 34	2 10.3	250 28	16 41.9	1.0658	1.2770	7.74	0.8887
	8	0.2697	22.63	1.509	32 43	2 10.9	249 25	16 37.7	1.0677	1.2774	7.70	0.8862
	9	0.2725	22.73	1.515	32 51	2 11.4	248 22	16 33.5	1.0702	1.2779	7.65	0.8836
	10	0.2752	22.86	1.524	32 55	2 11.7	247 19	16 29.3	1.0731	1.2783	7.60	0.8808
	11	0.2779	+23.02	+1.535	32 54	2 11.6	246 17	16 25.1	+1.0761	+1.2788	−7.55	−0.8778
	12	0.2807	23 19	1.546	32 48	2 11.2	245 14	16 21.0	1.0789	1.2792	7.50	0.8748
	13	0.2834	23.36	1.558	32 39	2 10.6	244 12	16 16.8	1.0813	1.2797	7.44	0.8716
	14	0.2862	23.51	1.568	32 27	2 9.8	243 10	16 12.7	1.0831	1.2802	7.38	0.8682
	15	0.2889	23.63	1.575	32 15	2 9.0	242 8	16 8.6	1.0843	1.2808	7.32	0 8647
	16	0.2916	+23.70	+1.580	32 6	2 8.4	241 7	16 4.4	+1.0849	+1.2813	−7.26	−0.8610
	17	0.2944	23.74	1.583	32 0	2 8.0	240 5	16 0.4	1.0852	1.2818	7.20	0.8572
	18	0.2971	23.75	1.583	32 0	2 8.0	239 4	15 56.3	1.0853	1.2824	7.13	0.8532
	19	0.2998	23.75	1.583	32 4	2 8.3	238 3	15 52.2	1.0856	1.2830	7.06	0.8490
	20	0.3026	23.75	1.583	32 13	2 8.9	237 2	15 48.1	1.0863	1.2836	6.99	0.8447
h (14.0)	21	0.3053	+23.77	+1.585	32 24	2 9.6	236 1	15 44.1	+1.0876	+1.2842	−6.92	−0.8403
	22	0.3081	23.83	1.589	32 35	2 10.3	235 1	15 40.1	1.0895	1.2848	6.85	0.8356
	23	0.3108	23.93	1.595	32 43	2 10.8	234 0	15 36.0	1.0920	1.2854	6.77	0.8308
	24	0.3135	24.07	1.605	32 47	2 11.1	233 0	15 32.0	1.0949	1.2860	6.70	0.8258
	25	0.3163	24 24	1.616	32 46	2 11.0	232 0	15 28.0	1.0978	1.2866	6.62	0.8206
	26	0.3190	+24.42	+1.628	32 39	2 10.6	231 1	15 24.1	+1.1006	+1.2872	−6.54	−0.8153
	27	0.3217	24.60	1.640	32 29	2 9.9	230 1	15 20.1	1.1030	1.2878	6.45	0.8097
	28	0.3245	24.76	1.651	32 17	2 9.2	229 2	15 16.1	1.1049	1.2884	6.37	0.8039
	29	0.3272	24.89	1.659	32 6	2 8.4	228 3	15 12.2	1.1062	1.2891	6.28	0.7979
	30	0.3300	24.99	1.666	31 56	2 7.8	227 4	15 8.3	1.1071	1.2897	6.19	0.7918
May	1	0.3327	+25.05	+1.670	31 51	2 7.4	226 6	15 4.4	+1.1078	+1.2903	−6.10	−0.7854
	2	0.3354	25.09	1.673	31 51	2 7.4	225 7	15 0.5	1.1085	1.2910	6.01	0.7789
	3	0.3382	25.13	1.676	31 54	2 7.6	224 9	14 56.6	1.1095	1.2916	5.92	0.7720
	4	0.3409	25.18	1.679	32 1	2 8.1	223 11	14 52.7	1.1109	1.2922	5.82	0.7650
	5	0.3436	25.26	1.684	32 9	2 8.6	222 13	14 48.9	1.1129	1.2929	5.72	0.7576
h (15.0)	6	0.3464	+25.38	+1.692	32 16	2 9.1	221 15	14 45.0	+1.1155	+1.2935	−5.62	−0.7501
	7	0.3491	25.53	1.702	32 21	2 9.4	220 18	14 41.2	1.1185	1.2941	5.52	0.7423
	8	0.3519	25.73	1.715	32 21	2 9.4	219 20	14 37.4	1.1217	1.2948	5.42	0.7343
	9	0.3546	25.93	1.729	32 17	2 9.1	218 23	14 33.6	1.1247	1.2954	5.32	0.7259
	10	0.3573	26.13	1.742	32 8	2 8.5	217 26	14 29.7	1.1276	1.2960	5.22	0.7173
	11	0.3601	+26.32	+1.755	31 57	2 7.8	216 30	14 26.0	+1.1299	+1.2966	−5.11	−0.7083
	12	0.3628	26.49	1.766	31 46	2 7.0	215 33	14 22.2	1.1316	1.2972	5.00	0.6992
	13	0.3656	26.61	1.774	31 35	2 6.3	214 37	14 18.5	1.1328	1.2978	4.89	0.6896
	14	0.3683	26.69	1.779	31 27	2 5.8	213 41	14 14.7	1.1335	1.2984	4.78	0.6797
	15	0.3710	26.74	1.783	31 24	2 5.6	212 45	14 11.0	1.1341	1.2989	4.67	0.6695
	16	0.3738	+26.77	+1.785	31 25	2 5.7	211 49	14 7.2	+1.1347	+1.2995	−4.56	−0.6588
	17	0.3765	+26.80	+1.787	31 30	2 6.0	210 53	14 3.5	+1.1356	+1.3001	−4.44	−0.6479

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
May 17	0.3765	+26.80	+1.787	31 30	2 6.0	210 53	14 3.5	+1.1356	+1.3001	−4.44	−0.6479
18	0.3792	26.85	1.790	31 37	2 6.4	209 57	13 59.8	1.1370	1.3006	4.33	0.6365
19	0.3820	26.93	1.796	31 45	2 7.0	209 2	13 56.1	1.1389	1.3012	4.21	0.6246
20	0.3847	27.06	1.804	31 51	2 7.4	208 7	13 52.5	1.1414	1.3017	4.10	0.6123
21	0.3875	27.22	1.815	31 54	2 7.6	207 12	13 48.7	1.1442	1.3022	3.98	0.5996
(16$^{\text{h}}$.0) 22	0.3902	+27.42	+1.828	31 52	2 7.5	206 17	13 45.1	+1.1472	+1.3027	−3.86	−0.5864
23	0.3929	27.63	1.842	31 46	2 7.1	205 22	13 41.5	1.1500	1.3032	3.74	0.5726
24	0.3957	27.84	1.856	31 36	2 6.4	204 28	13 37.8	1.1526	1.3037	3.62	0.5582
25	0.3984	28.04	1.870	31 24	2 5.6	203 33	13 34.2	1.1547	1.3042	3.49	0.5431
26	0.4011	28.21	1.881	31 11	2 4.7	202 39	13 30.6	1.1564	1.3046	3.37	0.5275
27	0.4039	+28.35	+1.890	30 59	2 3.9	201 45	13 27.0	+1.1576	+1.3050	−3.24	−0.5112
28	0.4066	28.46	1.897	30 50	2 3.4	200 51	13 23.4	1.1586	1.3055	3.12	0.4941
29	0.4094	28.54	1.902	30 46	2 3.0	199 57	13 19.8	1.1594	1.3059	2.99	0.4761
30	0.4120	28.60	1.907	30 45	2 3.0	199 3	13 16.2	1.1604	1.3063	2.87	0.4573
31	0.4148	28.68	1.912	30 48	2 3.2	198 9	13 12.6	1.1618	1.3066	2.74	0.4375
June 1	0.4176	+28.78	+1.919	30 52	2 3.4	197 15	13 9.0	+1.1636	+1.3070	−2.61	−0.4166
2	0.4203	28.92	1.928	30 56	2 3.7	196 22	13 5.5	1.1660	1.3074	2.48	0.3946
3	0.4231	29.09	1.939	30 58	2 3.9	195 28	13 1.9	1.1687	1.3077	2.35	0.3712
4	0.4258	29.29	1.953	30 57	2 3.8	194 35	12 58.3	1.1717	1.3080	2.22	0.3465
5	0.4285	29.52	1.968	30 52	2 3.4	193 42	12 54.8	1.1747	1.3083	2.09	0.3200
(17$^{\text{h}}$.0) 6	0.4313	+29.76	+1.984	30 42	2 2.8	192 49	12 51.2	+1.1774	+1.3086	−1.96	−0.2917
7	0.4340	29.99	1.999	30 30	2 2.0	191 56	12 47.7	1.1798	1.3088	1.83	0.2614
8	0.4367	30.18	2.012	30 17	2 1.1	191 3	12 44.2	1.1817	1.3091	1.69	0.2286
9	0.4395	30.35	2.023	30 4	2 0.3	190 10	12 40.6	1.1830	1.3093	1.56	0.1930
10	0.4422	30.47	2.031	29 53	1 59.5	189 17	12 37.1	1.1840	1.3095	1.43	0.1541
11	0.4449	+30.55	+2.037	29 45	1 59.0	188 24	12 33.6	+1.1846	+1.3097	−1.29	−0.1114
12	0.4477	30.61	2.040	29 41	1 58.8	187 31	12 30.1	1.1851	1.3099	1.16	0.0637
13	0.4504	30.66	2.044	29 41	1 58.8	186 38	12 26.6	1.1859	1.3101	1.02	0.0101
14	0.4532	30.72	2.048	29 44	1 59.0	185 46	12 23.0	1.1870	1.3102	0.89	9.9486
15	0.4559	30.81	2.054	29 48	1 59.2	184 53	12 19.5	1.1885	1.3103	0.75	9.8770
16	0.4586	+30.94	+2.062	29 52	1 59.4	184 1	12 16.0	+1.1905	+1.3104	−0.62	−9.7908
17	0.4614	31.11	2.074	29 52	1 59.5	183 8	12 12.5	1.1930	1.3105	0.48	9.6828
18	0.4641	31.31	2.087	29 50	1 59.3	182 15	12 9.0	1.1956	1.3105	0.35	9.5416
19	0.4668	31.53	2.102	29 43	1 58.9	181 23	12 5.5	1.1982	1.3106	0.21	9.3284
20	0.4696	31.76	2.118	29 32	1 58.1	180 30	12 2.0	1.2006	1.3106	−0.08	−8.8920
(18$^{\text{h}}$.0) 21	0.4723	+31.98	+2.132	29 18	1 57.2	179 38	11 58.5	+1.2026	+1.3106	+0.06	+8.7560
22	0.4751	32.18	2.145	29 4	1 56.3	178 45	11 55.0	1.2042	1.3106	0.19	9.2856
23	0.4778	32.34	2.156	28 50	1 55.3	177 53	11 51.5	1.2054	1.3105	0.33	9.5145
24	0.4805	32.47	2.164	28 38	1 54.5	177 0	11 48.0	1.2063	1.3105	0.46	9.6634
25	0.4833	32.56	2.171	28 30	1 54.0	176 8	11 44.5	1.2070	1.3104	0.60	9.7756
26	0.4860	+32.64	+2.176	28 25	1 53.7	175 15	11 41.0	+1.2077	+1.3103	+0.73	+9.8643
27	0.4888	32.72	2.182	28 23	1 53.6	174 23	11 37.5	1.2087	1.3102	0.87	9.9379
28	0.4915	32.82	2.188	28 24	1 53.6	173 30	11 34.0	1.2100	1.3101	1.00	0.0007
29	0.4942	32.95	2.197	28 25	1 53.7	172 38	11 30.5	1.2118	1.3099	1.14	0.0554
30	0.4970	33.11	2.208	28 25	1 53 7	171 45	11 27.0	1.2140	1.3097	1.27	0.1038
31	0.4997	+33.32	+2.221	28 24	1 53.6	170 52	11 23.5	+1.2165	+1.3096	+1.40	+0.1473
32	0.5024	+33.54	+2.236	28 18	1 53.2	169 59	11 20.0	+1.2191	+1.3094	+1.54	+0.1866

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
July 1	0.4997	+33.32	+2.221	28 24	1 53.6	170 52	11 23.5	+1.2165	+1.3096	+1.40	+0.1473
2	0.5024	33.54	2.236	28 18	1 53.2	169 59	11 20.0	1.2191	1.3094	1.54	0.1866
3	0.5052	33.78	2.252	28 9	1 52.6	169 7	11 16.4	1.2216	1.3091	1.67	0.2226
4	0.5079	34.01	2.268	27 56	1 51.8	168 14	11 12.9	1.2237	1.3089	1.80	0.2558
5	0.5107	34.22	2.282	27 42	1 50.8	167 21	11 9.4	1.2254	1.3086	1.93	0.2864
$(19^{h}.0)$ 6	0.5134	+34.40	+2.293	27 27	1 49.8	166 28	11 5.9	+1.2266	+1.3084	+2.07	+0.3150
7	0.5161	34.53	2.302	27 14	1 49.0	165 35	11 2.3	1.2274	1.3081	2.20	0.3416
8	0.5189	34.62	2.308	27 4	1 48.2	164 42	10 58.8	1.2279	1.3078	2.33	0.3666
9	0.5216	34.68	2.312	26 57	1 47.8	163 49	10 55.2	1.2282	1.3074	2.45	0.3901
10	0.5243	34.72	2.315	26 53	1 47.6	162 55	10 51.7	1.2285	1.3071	2.58	0.4124
11	0.5271	+34.78	+2.318	26 53	1 47.5	162 2	10 48.1	+1.2292	+1.3067	+2.71	+0.4334
12	0.5298	34.85	2.323	26 54	1 47.6	161 8	10 44.6	1.2301	1.3064	2.84	0.4533
13	0.5326	34.95	2.330	26 56	1 47.7	160 15	10 41.0	1.2315	1.3060	2.97	0.4723
14	0.5353	35.09	2.339	26 56	1 47.8	159 21	10 37.4	1.2333	1.3056	3.09	0.4903
15	0.5380	35.27	2.351	26 54	1 47.6	158 27	10 33.8	1.2353	1.3051	3.22	0.5075
16	0.5408	+35.48	+2.365	26 47	1 47.2	157 33	10 30.2	+1.2375	+1.3047	+3.34	+0.5239
17	0.5435	35.69	2.379	26 37	1 46.5	156 39	10 26.6	1.2395	1.3043	3.46	0.5394
18	0.5463	35.90	2.394	26 25	1 45.6	155 45	10 23.0	1.2412	1.3038	3.59	0.5547
19	0.5490	36.09	2 406	26 10	1 44.7	154 51	10 19.4	1.2426	1.3033	3.71	0.5691
20	0.5517	36.25	2.417	25 56	1 43.7	153 56	10 15.7	1.2436	1.3029	3.83	0.5830
$(20^{h}.0)$ 21	0.5545	+36.37	+2.425	25 42	1 42.8	153 1	10 12.1	+1.2443	+1.3024	+3.95	+0.5963
22	0.5572	36.46	2.431	25 32	1 42.1	152 7	10 8.5	1.2447	1.3018	4.07	0.6091
23	0.5600	36.52	2.435	25 25	1 41.7	151 12	10 4.8	1.2450	1.3013	4.18	0.6215
24	0.5627	36.58	2.439	25 22	1 41.5	150 17	10 1.2	1.2455	1.3008	4.30	0.6333
25	0.5654	36.65	2.443	25 21	1 41.4	149 22	9 57.5	1.2463	1.3002	4.41	0.6448
26	0.5682	+36.74	+2.450	25 21	1 41.4	148 27	9 53.8	+1.2474	+1.2997	+4.53	+0.6558
27	0.5709	36.87	2.458	25 22	1 41.4	147 32	9 50.1	1.2490	1.2991	4.64	0.6665
28	0.5736	37.04	2.469	25 20	1 41.3	146 37	9 46.5	1.2508	1.2985	4.75	0.6768
29	0.5764	37.24	2.482	25 16	1 41.1	145 41	9 42.7	1.2529	1.2980	4.86	0.6867
30	0.5791	37.45	2.497	25 8	1 40.6	144 45	9 39.0	1.2549	1.2974	4.97	0.6962
31	0.5818	+37.66	+2.511	24 58	1 39.8	143 49	9 35.3	+1.2567	+1.2968	+5.07	+0.7054
Aug. 1	0.5846	37.85	2.523	24 45	1 39.0	142 53	9 31.5	1.2582	1.2962	5.18	0.7144
2	0.5873	38.01	2.534	24 31	1 38.1	141 56	9 27.7	1.2592	1.2956	5.28	0.7230
3	0.5901	38.13	2.542	24 18	1 37.2	141 0	9 24.0	1.2598	1.2950	5.39	0.7313
4	0.5928	38.20	2.547	24 7	1 36.5	140 3	9 20.2	1.2600	1.2944	5.49	0.7394
5	0.5955	+38.24	+2.549	23 59	1 35.9	139 6	9 16.4	+1.2600	+1.2937	+5.59	+0.7473
$(21^{h}.0)$ 6	0.5983	38.26	2.551	23 54	1 35.6	138 9	9 12.6	1.2600	1.2931	5.69	0.7548
7	0.6010	38.28	2.552	23 53	1 35.5	137 12	9 8.8	1.2601	1.2925	5.78	0.7621
8	0.6037	38.31	2.554	23 54	1 35.6	136 14	9 4.9	1.2605	1.2919	5.88	0.7692
9	0.6065	38.37	2.558	23 56	1 35.7	135 17	9 1.1	1.2613	1.2912	5.97	0.7760
10	0.6092	+38.47	+2.565	23 58	1 35.8	134 19	8 57.2	+1.2625	+1.2906	+6.06	+0.7827
11	0.6120	38.61	2.574	23 57	1 35.8	133 21	8 53.4	1.2640	1.2899	6.15	0.7891
12	0.6147	38.78	2.585	23 53	1 35.5	132 22	8 49.5	1.2657	1.2893	6.24	0.7953
13	0.6174	38.96	2.597	23 46	1 35.1	131 24	8 45.6	1.2674	1.2887	6.33	0.8013
14	0.6202	39.14	2.609	23 36	1 34.4	130 25	8 41.7	1.2688	1.2881	6.41	0.8071
15	0.6229	+39.30	+2.620	23 24	1 33.6	129 26	8 37.8	+1.2699	+1.2875	+6.50	+0.8127
16	0.6257	+39.43	+2.629	23 11	1 32.7	128 27	8 33.8	+1.2707	+1.2869	+6.58	+0.8181

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Aug.	16	0.6257	+39.43	+2.629	23 11	1 32.7	128 27	8 33.8	+1.2707	+1.2869	+6.58	+0.8181
	17	0.6284	39.53	2.635	22 59	1 31.9	127 28	8 29.9	1.2711	1.2862	6.66	0.8233
	18	0.6311	39.59	2.639	22 49	1 31.3	126 29	8 25.9	1.2713	1.2856	6.73	0.8283
	19	0.6339	39.62	2.641	22 43	1 30.9	125 30	8 22.0	1.2713	1.2850	6.81	0.8332
	20	0.6366	39.65	2.643	22 40	1 30.6	124 30	8 18.0	1.2714	1.2844	6.88	0.8379
$(22^{h}.0)$	21	0.6393	+39.68	+2.645	22 39	1 30.6	123 30	8 14.0	+1.2717	+1.2838	+6.96	+0.8424
	22	0.6421	39.73	2.649	22 41	1 30.7	122 30	8 10.0	1.2723	1.2833	7.03	0.8468
	23	0.6448	39.81	2.654	22 43	1 30.9	121 29	8 6.0	1.2734	1.2827	7.10	0.8510
	24	0.6476	39.94	2.662	22 44	1 30.9	120 29	8 1.9	1.2748	1.2822	7.16	0.8550
	25	0.6503	40.09	2.673	22 43	1 30.9	119 28	7 57.9	1.2764	1.2816	7.23	0.8589
	26	0.6530	+40.26	+2.684	22 39	1 30.6	118 27	7 53 8	+1.2781	+1.2811	+7.29	+0.8626
	27	0.6558	40.44	2.696	22 32	1 30.1	117 26	7 49.8	1.2796	1.2805	7.35	0.8662
	28	0.6585	40.61	2.708	22 22	1 29.5	116 25	7 45.7	1.2810	1.2800	7.40	0.8695
	29	0.6612	40.75	2.717	22 11	1 28.8	115 24	7 41.6	1.2819	1.2795	7.46	0.8728
	30	0.6640	40.85	2.724	22 0	1 28.0	114 22	7 37.5	1.2824	1.2790	7.52	0.8760
	31	0.6667	+40.91	+2.727	21 51	1 27.4	113 21	7 33.4	+1.2825	+1.2786	+7.57	+0.8790
Sept.	1	0.6695	40.92	2.728	21 44	1 26.9	112 19	7 29.3	1.2823	1.2781	7.62	0.8817
	2	0.6722	40.92	2.728	21 41	1 26.7	111 17	7 25.1	1.2821	1.2777	7.66	0.8844
	3	0.6749	40.90	2.727	21 41	1 26.7	110 15	7 21.0	1.2819	1.2773	7.71	0.8870
	4	0.6777	40.90	2.727	21 43	1 26.9	109 13	7 16.8	1.2820	1.2769	7.75	0.8895
$(23^{h}.0)$	5	0.6804	+40.92	+2.728	21 47	1 27.2	108 10	7 12.7	+1.2824	+1.2765	+7.79	+0.8917
	6	0.6832	40.98	2.732	21 51	1 27.4	107 7	7 8.5	1.2833	1.2761	7.83	0.8938
	7	0.6859	41.07	2.738	21 54	1 27.6	106 5	7 4.3	1.2844	1.2758	7.87	0.8959
	8	0.6886	41.20	2.747	21 54	1 27.6	105 2	7 0.1	1.2858	1.2754	7.90	0.8978
	9	0.6914	41.35	2.757	21 51	1 27.4	103 59	6 55.9	1.2872	1.2751	7.94	0.8996
	10	0.6941	+41.51	+2.767	21 45	1 27.0	102 56	6 51.7	+1.2885	+1.2749	+7.96	+0.9012
	11	0.6968	41.65	2.777	21 37	1 26.5	101 53	6 47.5	1.2896	1.2746	7.99	0.9026
	12	0.6996	41.76	2.784	21 28	1 25.8	100 49	6 43.3	1.2904	1.2743	8.02	0.9040
	13	0.7023	41.85	2.790	21 19	1 25.2	99 46	6 39.1	1.2908	1.2741	8.04	0.9053
	14	0.7051	41.89	2.793	21 11	1 24.7	98 43	6 34.8	1.2909	1.2739	8.06	0.9064
	15	0.7078	+41.91	+2.794	21 6	1 24.4	97 39	6 30.6	+1.2908	+1.2737	+8.08	+0.9073
	16	0.7105	41.91	2.794	21 5	1 24.3	96 35	6 26.3	1.2908	1.2736	8.09	0.9081
	17	0.7133	41.92	2.795	21 7	1 24.4	95 32	6 22.1	1.2909	1.2734	8.11	0.9089
	18	0.7160	41.94	2.796	21 11	1 24.7	94 28	6 17.8	1.2914	1.2733	8.12	0.9095
	19	0.7187	42.00	2.800	21 16	1 25.0	93 24	6 13.6	1.2921	1.2732	8.13	0.9099
$(0^{h}.0)$	20	0.7215	+42.09	+2.806	21 20	1 25.3	92 20	6 9.3	+1.2933	+1.2732	+8.13	+0.9102
	21	0.7242	42.22	2.814	21 23	1 25.5	91 16	6 5.0	1.2948	1.2731	8.14	0.9105
	22	0.7270	42.37	2.825	21 23	1 25.5	90 12	6 0.8	1.2964	1.2731	8.14	0.9106
	23	0.7297	42.53	2.836	21 20	1 25.4	89 7	5 56.5	1.2979	1.2731	8.14	0.9105
	24	0.7324	42.69	2.846	21 15	1 25.0	88 3	5 52.2	1.2993	1.2732	8.14	0.9103
	25	0.7352	+42.83	+2.855	21 8	1 24.5	86 59	5 48.0	+1.3003	+1.2732	+8.13	+0.9100
	26	0.7379	42.93	2.862	21 0	1 24.0	85 55	5 43.7	1.3010	1.2733	8.12	0.9096
	27	0.7406	42.99	2.866	20 53	1 23.5	84 51	5 39.4	1.3013	1.2734	8.11	0.9091
	28	0.7434	43.01	2.867	20 48	1 23.2	83 47	5 35.1	1.3012	1.2735	8.10	0.9084
	29	0.7461	43.00	2.867	20 47	1 23.1	82 43	5 30.8	1.3011	1.2736	8.08	0.9076
	30	0.7489	+42.98	+2.865	20 48	1 23.2	81 38	5 26.6	+1.3009	+1.2738	+8.06	+0.9066
	31	0.7516	+42.97	+2.864	20 53	1 23.5	80 34	5 22.3	+1.3010	+1.2740	+8.04	+0.9056

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Oct. 1	0.7516	+42.97	+2.864	20 53	1 23.5	80 34	5 22.3	+1.3010	+1.2740	+8.04	+0.9056
2	0.7543	42.97	2.865	21 0	1 24.0	79 30	5 18.0	1.3013	1.2742	8.02	0.9044
3	0.7571	43.01	2.867	21 7	1 24.4	78 26	5 13.7	1.3021	1.2745	8.00	0.9031
4	0.7598	43.09	2.873	21 13	1 24.8	77 22	5 9.5	1.3032	1.2748	7.97	0.9016
(1^{h}.0) 5	0.7625	43.21	2.880	21 17	1 25.1	76 18	5 5.2	1.3046	1.2750	7.94	0.9000
6	0.7653	+43.35	+2.890	21 17	1 25.2	75 14	5 0.9	+1.3061	+1.2753	+7.91	+0.8982
7	0.7680	43.51	2.901	21 15	1 25.0	74 10	4 56.7	1.3075	1.2757	7.88	0.8963
8	0.7708	43.66	2.910	21 11	1 24.7	73 6	4 52.4	1.3088	1.2761	7.84	0.8943
9	0.7735	43.78	2.919	21 5	1 24.3	72 2	4 48.2	1.3098	1.2764	7.80	0.8922
10	0.7762	43.88	2.925	20 58	1 23.9	70 59	4 43.9	1.3104	1.2768	7.76	0.8899
11	0.7790	+43.94	+2.930	20 53	1 23.5	69 55	4 39.7	+1.3108	+1.2772	+7.72	+0.8874
12	0.7817	43.98	2.932	20 50	1 23.3	68 52	4 35.5	1.3110	1.2776	7.67	0.8848
13	0.7844	43.99	2.933	20 50	1 23.3	67 48	4 31.2	1.3111	1.2781	7.62	0.8821
14	0.7872	44.00	2.933	20 53	1 23.5	66 45	4 27.0	1.3114	1.2785	7.57	0.8791
15	0.7899	44.03	2.935	20 59	1 23.9	65 42	4 22.8	1.3119	1.2790	7.52	0.8761
16	0.7927	+44.08	+2.939	21 6	1 24.4	64 39	4 18.6	+1.3128	+1.2795	+7.47	+0.8730
17	0.7954	44.17	2.945	21 12	1 24.8	63 36	4 14.4	1.3140	1.2800	7.41	0.8696
18	0.7981	44.30	2.954	21 18	1 25.2	62 33	4 10.2	1.3156	1.2806	7.35	0.8661
19	0.8009	44.47	2.965	21 21	1 25.4	61 30	4 6.0	1.3173	1.2811	7.29	0.8625
20	0.8036	44.65	2.977	21 21	1 25.4	60 27	4 1.8	1.3191	1.2817	7.22	0.8587
(2^{h}.0) 21	0.8064	+44.83	+2.989	21 18	1 25.2	59 25	3 57.6	+1.3207	+1.2822	+7.16	+0.8546
22	0.8091	45.00	3.000	21 14	1 24.9	58 22	3 53.5	1.3221	1.2828	7.09	0.8504
23	0.8118	45.13	3.009	21 8	1 24.5	57 20	3 49.3	1.3231	1.2834	7.02	0.8461
24	0.8146	45.23	3.015	21 3	1 24.2	56 18	3 45.2	1.3237	1.2840	6.94	0.8416
25	0.8173	45.26	3.019	20 59	1 24.0	55 16	3 41.1	1.3241	1.2846	6.87	0.8368
26	0.8200	+45.30	+3.020	20 58	1 23.9	54 14	3 36.9	+1.3243	+1.2852	+6.79	+0.8319
27	0.8228	45.31	3.021	21 0	1 24.0	53 12	3 32.8	1.3245	1.2858	6.71	0.8268
28	0.8255	45.32	3.021	21 5	1 24.3	52 11	3 28.7	1.3247	1.2865	6.63	0.8215
29	0.8283	45.34	3.023	21 12	1 24.8	51 9	3 24.6	1.3253	1.2871	6.55	0.8160
30	0.8310	45.39	3.026	21 20	1 25.3	50 8	3 20.5	1.3262	1.2877	6.46	0.8103
31	0.8337	+45.49	+3.033	21 27	1 25.8	49 7	3 16.5	+1.3275	+1.2884	+6.37	+0.8044
Nov. 1	0.8365	45.62	3.042	21 32	1 26.2	48 6	3 12.4	1.3291	1.2890	6.28	0.7983
2	0.8392	45.79	3.053	21 35	1 26.3	47 5	3 8.3	1.3308	1.2897	6.19	0.7919
3	0.8420	45.97	3.065	21 35	1 26.3	46 4	3 4.3	1.3325	1.2903	6.10	0.7853
4	0.8447	46.16	3.077	21 32	1 26.1	45 4	3 0.3	1.3340	1.2910	6.00	0.7784
(3^{h}.0) 5	0.8474	+46.33	+3.089	21 27	1 25.8	44 3	2 56.2	+1.3354	+1.2917	+5.91	+0.7713
6	0.8502	46.47	3.097	21 21	1 25.4	43 3	2 52.2	1.3364	1.2923	5.81	0.7639
7	0.8529	46.57	3.105	21 16	1 25.1	42 3	2 48.2	1.3372	1.2930	5.71	0.7564
8	0.8556	46.65	3.110	21 13	1 24.9	41 3	2 44.2	1.3377	1.2936	5.60	0.7485
9	0.8584	46.70	3.113	21 12	1 24.8	40 4	2 40.2	1.3382	1.2943	5.50	0.7403
10	0.8611	+46.75	+3.116	21 14	1 25.0	39 4	2 36.3	+1.3387	+1.2949	+5.39	+0.7318
11	0.8638	46.80	3.120	21 19	1 25.3	38 4	2 32.3	1.3395	1.2956	5.28	0.7230
12	0.8666	46.88	3.125	21 25	1 25.7	37 5	2 28.3	1.3405	1.2962	5.17	0.7139
13	0.8693	47.00	3.133	21 31	1 26.1	36 6	2 24.4	1.3419	1.2968	5.06	0.7044
14	0.8721	47.15	3.144	21 36	1 26.4	35 7	2 20.5	1.3436	1.2975	4.95	0.6947
15	0.8748	+47.35	+3.156	21 40	1 26.6	34 8	2 16.5	+1.3455	+1.2981	+4.84	+0.6846
16	0.8775	+47.56	+3.171	21 40	1 26.7	33 9	2 12.6	+1.3475	+1.2987	+4.72	+0.6740

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Nov. 16	0.8775	+47.56	+3.171	21 40	1 26.7	33 9	2 12.6	+1.3475	+1.2987	+4.72	+0.6740
17	0.8803	47.78	3.186	21 38	1 26.5	32 11	2 8.7	1.3494	1.2993	4.60	0.6630
18	0.8830	47.99	3.200	21 33	1 26.2	31 12	2 4.8	1.3511	1.2999	4.48	0.6517
19	0.8858	48.18	3.212	21 27	1 25.8	30 14	2 0.9	1.3525	1.3005	4.36	0.6399
($4^{h}.0$) 20	0.8885	48.33	3.222	21 21	1 25.4	29 16	1 57.1	1.3535	1.3011	4.24	0.6275
21	0.8912	+48.43	+3.229	21 16	1 25.1	28 18	1 53.2	+1.3542	+1.3016	+4.12	+0 6147
22	0.8940	48.50	3.234	21 13	1 24.9	27 20	1 49.3	1.3547	1.3022	3.99	0.6014
23	0.8967	48.55	3.237	21 13	1 24.9	26 22	1 45.5	1.3551	1.3027	3.87	0.5876
24	0.8994	48.59	3.240	21 16	1 25.1	25 24	1 41.6	1.3556	1.3032	3.74	0.5731
25	0.9022	48.65	3.243	21 21	1 25.4	24 27	1 37.8	1.3563	1.3037	3.61	0.5579
26	0.9049	+48.73	+3.249	21 26	1 25.8	23 29	1 33.9	+1.3574	+1.3042	+3.48	+0.5421
27	0.9077	48.85	3.257	21 32	1 26.1	22 32	1 30.1	1.3587	1.3047	3.35	0.5255
28	0.9104	49.01	3.268	21 36	1 26.4	21 34	1 26.3	1.3604	1.3051	3.22	0.5081
29	0.9131	49.21	3.280	21 38	1 26.5	20 37	1 22.5	1.3622	1.3056	3.09	0.4899
30	0.9159	49.42	3.295	21 37	1 26.4	19 40	1 18.7	1.3640	1.3060	2.95	0.4706
Dec. 1	0.9186	+49.65	+3.310	21 33	1 26.2	18 43	1 14.9	+1.3658	+1.3064	+2.82	+0.4503
2	0.9213	49.86	3.324	21 27	1 25.8	17 46	1 11.1	1.3673	1.3068	2.68	0.4289
3	0.9241	50.04	3.336	21 20	1 25.3	16 50	1 7.3	1.3686	1.3072	2.55	0.4064
4	0.9268	50.19	3.346	21 13	1 24.9	15 53	1 3.5	1.3696	1.3076	2.41	0.3822
($5^{h}.0$) 5	0.9296	50.31	3.354	21 7	1 24.5	14 56	0 59.8	1.3703	1.3079	2.27	0.3565
6	0.9323	+50.40	+3.360	21 4	1 24.3	14 0	0 56.0	+1.3709	+1.3082	+2.13	+0.3291
7	0.9350	50.48	3.365	21 3	1 24.2	13 3	0 52.2	1.3715	1.3085	1.99	0.2997
8	0.9378	50.56	3.371	21 4	1 24.3	12 7	0 48.5	1.3723	1.3088	1.85	0.2680
9	0.9405	50.67	3.378	21 7	1 24.5	11 10	0 44.7	1.3733	1.3091	1.71	0.2337
10	0.9433	50.80	3.387	21 11	1 24.7	10 14	0 40.9	1.3747	1.3093	1.57	0.1962
11	0.9460	+50.98	+3.398	21 14	1 24.9	9 18	0 37.2	+1.3763	+1.3095	+1.43	+0.1550
12	0.9487	51.19	3.412	21 16	1 25.0	8 22	0 33.4	1.3782	1.3097	1.29	0.1094
13	0.9515	51.43	3.428	21 15	1 25.0	7 25	0 29.7	1.3802	1.3099	1.14	0.0582
14	0.9542	51.67	3.445	21 11	1 24.7	6 29	0 25.9	1.3821	1.3101	1.00	0.0000
15	0.9569	51,92	3.461	21 5	1 24.3	5 33	0 22.2	1.3838	1.3102	0.85	9.9325
16	0.9597	+52.14	+3.476	20 57	1 23.8	4 37	0 18.5	+1.3853	+1.3103	+0.71	+9.8524
17	0.9624	52.33	3.488	20 49	1 23.3	3 41	0 14.7	1.3865	1.3104	0.57	9.7546
18	0.9652	52.47	3.498	20 42	1 22.8	2 45	0 11.0	1.3873	1.3105	0.42	9.6275
19	0.9679	52.57	3.505	20 36	1 22.4	1 49	0 7.2	1.3879	1.3105	0.28	9.4461
20	0.9706	52.65	3.510	20 32	1 22.2	0 53	0 3.5	1.3884	1.3106	+0.14	+9.1335
($6^{h}.0$) 21	0 9734	+52.71	+3.514	20 32	1 22.1	359 57	23 59.8	+1.3888	+1.3106	−0.01	−7.9445
22	0.9761	52.78	3.519	20 33	1 22.2	359 0	23 56.0	1.3894	1.3106	0.15	9.1861
23	0.9788	52.87	3.524	20 35	1 22.3	358 4	23 52.3	1.3902	1.3105	0.30	9.4745
24	0.9816	52.99	3.533	20 38	1 22.5	357 8	23 48.6	1.3914	1.3105	0.44	9.6462
25	0.9843	53.15	3.544	20 40	1 22.7	356 12	23 44.8	1.3928	1.3104	0.59	9.7689
26	0.9871	+53.35	+3.557	20 40	1 22.7	355 16	23 41.1	+1.3944	+1.3103	−0.73	−9.8634
27	0.9898	53.57	3.572	20 37	1 22.5	354 20	23 37.3	1.3961	1.3102	0.87	9.9417
28	0.9925	53.80	3.587	20 32	1 22.2	353 24	23 33.6	1.3978	1.3101	1.02	0.0079
29	0.9953	54.03	3.602	20 25	1 21.7	352 27	23 29.8	1.3993	1.3099	1.16	0.0653
30	0.9980	54.23	3.615	20 16	1 21.1	351 31	23 26.1	1.4004	1.3097	1.30	0.1157
31	1.0007	+54.40	+3.627	20 8	1 20.5	350 35	23 22.3	+1.4014	+1.3095	−1.45	−0.1608
32	1.0035	+54.53	+3.635	20 0	1 20.0	349 38	23 18.6	+1.4021	+1.3093	−1.59	−0.2015

MEAN PLACES FOR 1883.0. (January 0d.0—0d.015, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
α Andromedæ	2.0	0 2 20.480	+ 3.0902	+ 28 26 39.88	+ 19.886
* β Cassiopeæ	2.0	0 2 56.388	3.1706	+ 58 30 14.85	19.853
* 22 Andromedæ	5.3	0 4 14.570	3.1002	+ 45 25 15.45	20.037
4 Draconis (H.) . S. P.	4.7	0 6 42.564	2.8936	+101 44 0.86	20.024
γ Pegasi (*Algenib*)	2.7	0 7 12.704	3.0831	+ 14 31 58.88	20.025
* σ Andromedæ	4.3	0 12 13.063	+ 3.1214	+ 35 8 11.06	+ 19.985
* ι Ceti	3.3	0 13 27.858	3.0529	− 9 28 22.21	19.960
* 6 Ursæ Minoris . S. P.	6.0	0 14 19.510	0.0920	+ 91 39 4.97	19.941
* 44 Piscium	6.0	0 19 24.299	3.0729	+ 1 17 29.95	19.956
β Hydri	3.0	0 19 34.897	3.2409	− 77 54 47.80	20.287
12 Ceti	6.0	0 24 4.061	+ 3.0610	− 4 36 14.05	+ 19.942
κ Draconis . S. P.	3.3	0 28 29.071	2.5953	+109 34 0.31	19.893
* π Andromedæ	4.0	0 30 38.007	3.1890	+ 33 4 30.04	19.876
α Cassiopeæ (*var.*)	2.5	0 33 52.445	3.3702	+ 55 53 43.49	19.795
β Ceti	2.0	0 37 42.991	3.0147	− 18 37 44.75	19.808
21 Cassiopeæ	6.0	0 37 56.251	+ 3.8471	+ 74 20 53.78	+ 19.758
* ο Cassiopeæ	5.0	0 38 12.519	3.3165	+ 47 38 37.45	19.760
* δ Piscium	4.3	0 42 36.739	3.1068	+ 6 56 52.91	19.655
32² Camelop. (H.) . S. P.	4.7	0 48 16.753	0.3788	+ 95 57 4.06	19.597
* γ Cassiopeæ	2.0	0 49 39.241	3.5743	+ 60 4 57.99	19.571
* μ Andromedæ	4.0	0 50 15.684	+ 3.3091	+ 37 51 52.15	+ 19.625
* 43 Cephei (H.)	4.3	0 52 57.830	7.1460	+ 85 37 43.44	19.520
ε Piscium	4.0	0 56 52.277	3.1085	+ 7 15 35.67	19.463
β Andromedæ	2.3	1 3 11.022	3.3424	+ 34 59 59.53	19.174
* *f* Piscium	5.0	1 11 45.835	3.0892	+ 2 59 52.47	19.044
* κ Tucanæ	5.0	1 11 48.020	+ 2.0560	− 69 29 51.36	+ 19.180
α Ursæ Minoris (*Polaris*)	2.0	1 15 52.079	22.1290	+ 88 41 5.91	18.964
θ¹ Ceti	3.0	1 18 10.510	2.9969	− 8 47 14.86	18.678
38 Cassiopeæ	6.3	1 22 32.314	4.3685	+ 69 39 42.50	18.692
η Piscium	3.7	1 25 13.409	3.2017	+ 14 44 32.11	18.676
* υ Andromedæ	4.0	1 29 56.002	+ 3.5020	+ 40 49 11.51	+ 18.159
* π Piscium	5.7	1 30 53.813	3.1697	+ 11 32 33.64	18.538
α Eridani (*Achernar*)	1.0	1 33 21.066	2.2332	− 57 49 53.34	18.366
* ν Piscium	4.7	1 35 20.587	3.1173	+ 4 53 42.29	18.342
ο Piscium	4.3	1 39 12.962	3.1616	+ 8 34 5.72	18.230
* ζ Ceti	3.0	1 45 41.115	+ 2.9617	− 10 54 51.76	+ 17.838
β Arietis	3.0	1 48 10.668	3.3023	+ 20 14 7.95	17.743
50 Cassiopeæ	4.0	1 53 27.803	4.9990	+ 71 51 15.31	17.670
* γ Andromedæ	2.3	1 56 43.233	3.6579	+ 41 46 3.26	17.460
α Arietis	2.0	2 0 34.754	3.3697	+ 22 54 30.77	17.190
α Draconis . S. P.	3.3	2 1 13.365	+ 1.6235	+115 3 53.17	+ 17.308
* β Trianguli	3.0	2 2 35.054	3.5526	+ 34 25 59.37	17.222
ξ¹ Ceti	4.3	2 6 47.971	+ 3.1733	+ 8 17 50.00	17.047
* 4 Ursæ Minoris . S. P.	5.0	2 9 19.313	− 0.3327	+101 54 9.60	16.909
* γ Trianguli	4.3	2 10 21.656	+ 3.5491	+ 33 18 19.22	16.863
* 67 Ceti	6.0	2 11 8.845	+ 2.9890	− 6 57 43.34	+ 16.749
ι Cassiopeæ	4.0	2 19 26.142	4.8538	+ 66 52 31.08	16.460
* δ Hydri	4.0	2 19 40.237	1.0530	− 69 11 31.09	16.463
ξ² Ceti	4.0	2 21 56.355	+ 3.1830	+ 7 56 5.61	16.313
5 Ursæ Minoris . S. P.	4.7	2 27 47.155	− 0.1979	+103 47 2.07	+ 16.011

* Apparent places of stars marked with an asterisk are not given in this Ephemeris.

MEAN PLACES FOR 1883.0. (January $0^d.0-0^d.015$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* δ Ceti	4.0	2 33 29.161	+ 3.0723	− 0 10 37.57	+ 15.715
* μ Hydri	6.0	2 34 10.640	− 1.4522	− 79 37 9.96	15.676
* θ Persei	4.0	2 36 12.789	+ 4.0665	+ 48 43 57.14	15.483
γ Ceti	3.3	2 37 14.305	+ 3.1027	+ 2 44 31.12	15.359
* σ Arietis	5.7	2 45 2.032	+ 3.3036	+ 14 35 56.65	15.029
* 47 Cephei (H.)	6.0	2 50 34.871	+ 7.0924	+ 78 57 15.17	+ 14.744
β Ursæ Minoris . . S. P.	2.0	2 51 3.464	− 0.2376	+105 21 58.92	14.718
* ε Arietis	4.3	2 52 31.385	+ 3.4199	+ 20 52 17.60	14.629
α Ceti	2.3	2 56 9.826	+ 3.1297	+ 3 37 47.62	14.330
* β Persei (*Algol*) (*var.*)	2.7	3 0 33.516	+ 3.8814	+ 40 30 13.39	14.147
48 Cephei (H.)	6 3	3 5 30.923	+ 7.3840	+ 77 18 9.70	+ 13.782
ζ Arietis	4.7	3 8 10.643	+ 3.4382	+ 20 36 35.62	13.581
α Persei	2.0	3 15 58.468	+ 4.2544	+ 49 26 36.57	13.125
* ι Hydri	5.0	3 18 53.900	− 1.6118	− 77 48 54.53	13.017
γ^2 Ursæ Minoris . . S. P.	3.0	3 20 55.361	− 0.1384	+107 44 58.86	12.810
* *f* Tauri	4.0	3 24 24.833	+ 3.3041	+ 12 32 5.20	+ 12.589
ε Eridani	3.0	3 27 25.096	+ 2.8233	− 9 51 17.82	12.415
δ Persei	3.3	3 34 35.909	+ 4.2473	+ 47 24 43.40	11.843
* γ Camelopardalis (H.)	4.3	3 38 1.485	+ 6.2281	+ 70 58 11.04	11.594
η Tauri	3.0	3 40 31.815	+ 3.5558	+ 23 44 31.94	11.409
ζ Persei	3.0	3 46 46.737	+ 3.7588	+ 31 32 5.55	+ 10.980
ζ Ursæ Minoris . . S. P.	4.3	3 48 15.743	− 2.2644	+101 50 46.37	10.904
* γ Hydri	3.3	3 49 3.756	− 1.0042	− 74 35 50.06	10.978
* ε Persei	3.3	3 50 0.228	+ 4.0081	+ 39 40 13.39	10.755
γ Eridani	3.0	3 52 34.282	+ 2.7982	− 13 50 32.14	10.469
* A^1 Tauri	4.7	3 57 46.760	+ 3.5390	+ 21 45 39.16	+ 10.112
* *c* Persei	4.0	4 0 10.217	+ 4.3348	+ 47 23 55.05	9.976
Groombr. 2320 . . S. P.	6.3	4 6 0.213	+ 0.1372	+111 52 53.37	9.499
* o^1 Eridani	4.3	4 6 9.265	+ 2.9264	− 7 8 37.39	9.642
γ Tauri	4.0	4 13 8.148	+ 3.4082	+ 15 20 38.27	8.988
* η Ursæ Minoris . . S. P.	5.0	4 20 56.211	− 1.8238	+103 58 31.95	+ 8.146
ε Tauri	3.7	4 21 47.108	+ 3.4967	+ 18 55 10.90	8.289
η Draconis . . . S. P.	2.7	4 22 24.614	+ 0.8051	+118 13 14.75	8.229
* *m* Persei	6.0	4 25 11.082	+ 4.2085	+ 42 48 44.66	8.042
* δ Mensæ	6.0	4 25 55.298	− 4.2426	− 80 29 11.41	8.000
A Draconis . . . S. P.	5.0	4 28 13.128	− 0.1376	+110 58 44.09	+ 7.797
α Tauri (*Aldebaran*)	1.0	4 29 12.454	+ 3.4366	+ 16 16 22.31	7.547
* τ Tauri	4.3	4 35 13.392	+ 3.5946	+ 22 43 52.07	7.218
α Camelopardalis	4.7	4 42 25.355	+ 5.9206	+ 66 8 30.25	6.658
* *i* Tauri	5.3	4 44 31.810	+ 3.5047	+ 18 38 21.80	6.439
ι Aurigæ	3.0	4 49 22.514	+ 3.8997	+ 32 58 45.95	+ 6.061
* ζ Aurigæ	4.0	4 54 18.050	+ 4.1839	+ 40 54 12.57	5.664
11 Orionis	5.0	4 57 53.010	+ 3.4238	+ 15 14 23.49	5.331
ε Ursæ Minoris . . S. P.	4.3	4 57 59.995	− 0.3515	+ 97 46 20.12	5.362
* β Eridani	3.0	5 2 5.875	+ 2.9482	− 5 14 19.63	4.954
α Aurigæ (*Capella*)	1.0	5 8 2.820	+ 4.4237	+ 45 52 38.34	+ 4.073
β Orionis (*Rigel*)	1.0	5 8 54.910	+ 2.8810	− 8 20 16.41	4.427
* τ Orionis	4.0	5 11 55.520	+ 2.9123	− 6 58 19.48	4.165
β Tauri	2.0	5 18 53.773	+ 3.7887	+ 28 30 25.84	3.397
Groombridge 966	6.3	5 24 5.565	+ 7.9959	+ 74 57 47.96	+ 3.148

* Apparent places of stars marked with an asterisk are not given in this Ephemeris.

MEAN PLACES FOR 1883.0. (January 0^{d}.0—0^{d}.015, Washington.)

	Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
*	Groombridge 944 . .	6.3	5	24	37.900	+18.6130	+ 85	8	1.53	+ 3.094
*	χ Aurigæ	5.0	5	25	6.845	+ 3.9044	+ 32	6	15.43	3.061
	δ Orionis (*var.*) . . .	2.5	5	26	1.766	+ 3.0631	− 0	23	12.91	2.957
	α Leporis	3.0	5	27	34.205	+ 2.6446	− 17	54	25.32	2.828
	ε Orionis	2.0	5	30	16.598	+ 3.0421	− 1	16	40.05	2.594
	α Columbæ	2.0	5	35	24.804	+ 2.1726	− 34	8	14.30	+ 2.102
	ω Draconis . . . S. P.	5.0	5	37	38.281	− 0.3545	+111	11	17.28	1.630
*	κ Orionis	2.7	5	42	12.426	+ 2.8447	− 9	42	44.26	1.559
*	ν Aurigæ	4.0	5	43	22.840	+ 4.1540	+ 39	6	45.20	1.489
	ψ^1 Draconis . . . S. P.	4.3	5	44	1.235	− 1.0803	+107	47	39.07	1.670
*	δ Doradus	4.3	5	44	34.020	+ 0.1048	− 65	46	45.46	+ 1.330
	α Orionis (*var.*) . . .	1.2	5	48	50.256	+ 3.2468	+ 7	23	2.36	0.984
*	β Aurigæ	2.0	5	50	56.800	+ 4.4014	+ 44	56	1.67	0.782
*	θ Aurigæ	3.0	5	51	44.612	+ 4.0918	+ 37	12	10.36	+ 0.634
	ν Orionis	4.7	6	0	53.552	+ 3.4273	+ 14	46	52.03	− 0.108
	22 Camelopardalis (H.)	4.7	6	5	56.879	+ 6.6179	+ 69	21	30.28	− 0.638
*	η Geminorum . . .	3.3	6	7	48.940	+ 3.6227	+ 22	32	21.77	0.700
	δ Ursæ Minoris . . S. P.	4.3	6	10	3.844	−19.4475	+ 93	23	24.06	0.931
	μ Geminorum . . .	3.0	6	15	52.954	+ 3.6315	+ 22	34	20.01	1.510
*	ψ^1 Aurigæ	5.3	6	15	53.230	+ 4.6268	+ 49	20	45.07	1.399
	α Argus (*Canopus*). .	1.0	6	21	21.374	+ 1.3303	− 52	37	55.63	− 1.857
*	ν Geminorum . . .	4.7	6	22	0.948	+ 3.5631	+ 20	17	5.39	1.945
*	χ Draconis . . . S. P.	4.0	6	23	9.891	− 1.0789	+107	19	6.02	1.647
	γ Geminorum . . .	2.3	6	30	57.170	+ 3.4675	+ 16	29	52.27	2.747
*	ε Geminorum . . .	3.3	6	36	43.992	+ 3.6936	+ 25	14	44.20	3.214
*	ψ^5 Aurigæ	5.7	6	38	18.272	+ 4.3295	+ 43	41	32.21	− 3.189
†	α Canis Majoris (*Sirius*)	1.0	6	39	59.553	+ 2.6437	− 16	33	23.80	4.688
*	θ Geminorum . . .	3.3	6	45	4.647	+ 3.9610	+ 34	6	3.35	3.951
	51 Cephei (H.) . . .	5.3	6	45	15.606	+30.0575	+ 87	13	33.51	4.028
*	ζ Mensæ	5.8	6	49	45.767	− 4.8918	− 80	41	17.75	4.244
	50 Draconis . . . S. P.	6.0	6	50	8.402	− 1.9045	+104	42	16.83	− 4.427
	ε Canis Majoris . . .	1.7	6	54	1.685	+ 2.3576	− 28	48	49.60	4.696
*	ζ Geminorum (*var.*) .	4.0	6	57	10.454	+ 3.6527	+ 20	44	26.12	4.969
*	63 Aurigæ	5.0	7	3	36.405	+ 4.1374	+ 39	30	36.10	5.475
	δ Canis Majoris . . .	2.0	7	3	38.047	+ 2.4384	− 26	12	29.59	5.487
*	25 Camelopardalis . .	4.7	7	6	23.837	+12.9900	+ 82	37	57.21	− 5.760
*	γ^2 Volantis (*var.*) . .	4.7	7	9	44.309	− 0.4844	− 70	18	30.32	5.890
	δ Draconis . . . S. P.	3.0	7	12	31.528	+ 0.0310	+112	32	39.34	6.326
	δ Geminorum . . .	3.3	7	13	8.103	+ 3.5884	+ 22	11	47.30	6.307
	τ Draconis . . . S. P.	4.7	7	17	47.828	− 1.1132	+106	51	43.60	6.786
	Piazzi vii. 67 . . .	6.0	7	18	41.881	+ 6.3041	+ 68	42	9.07	− 6.788
*	β Canis Minoris . . .	3.0	7	20	48.335	+ 3.2600	+ 8	31	25.92	6.962
	α^2 Geminorum (*Castor*)	1.7	7	27	8.061	+ 3.8393	+ 32	8	37.91	7.519
†	α Canis Min. (*Procyon*)	1.0	7	33	10.617	+ 3.1438	+ 5	31	25.63	8.967
	β Geminorum (*Pollux*)	1.3	7	38	9.339	+ 3.6801	+ 28	18	27.27	8.385
	λ Ursæ Minoris . . S. P.	6.3	7	41	2.947	−63.0270	+ 91	2	57.35	− 8.568
*	Groombridge 1374 .	5.7	7	46	9.956	+ 7.2975	+ 74	13	40.96	8.994
*	26 Lyncis	6.0	7	46	11.376	+ 4.3902	+ 47	51	59.01	8.983
	φ Geminorum . . .	5.0	7	46	20.162	+ 3.6808	+ 27	4	2.90	8.998
	ε Draconis . . . S. P.	3.7	7	48	33.701	− 0.1764	+110	1	48.21	− 9.175

* Apparent places of stars marked with an asterisk are not given in this Ephemeris.

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1883.0. (January $0^d.0-0^d.015$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* ω^1 Cancri	6.0	7 53 51.086	+ 3.6381	+ 25 42 43.49	− 9.549
3 Ursæ Majoris (H.)	5.7	8 1 9.464	+ 6.0567	+ 68 48 59.54	10.112
15 Argus (ι)	3.0	8 2 33.688	+ 2.5544	− 23 58 4.01	10.174
* ζ^1 Cancri	4.7	8 5 30.071	+ 3.4471	+ 17 59 56.27	10.576
* β Cancri	3.7	8 10 10.170	+ 3.2590	+ 9 32 41.99	10.831
κ Cephei (*pr.*) S. P.	4.3	8 12 48.386	− 1.9124	+102 38 29.42	− 11.009
* 30 Monocerotis	3.7	8 19 48.822	+ 3.0002	− 3 31 32.26	11.484
* θ Chamæleontis	4.7	8 24 7.563	− 1.7000	− 77 6 23.16	11.774
η Cancri	5.7	8 25 56.543	+ 3.4792	+ 20 50 15.41	11.978
Groombr. 3241 S. P.	6.3	8 30 30.186	− 0.2155	+107 51 53.21	12.223
* σ Hydræ	5.0	8 32 38.565	+ 3.1462	+ 3 45 4.56	− 12.411
* γ Cancri	4.3	8 36 30.865	+ 3.4814	+ 21 53 17.68	12.700
ε Hydræ	3.3	8 40 34.795	+ 3.1822	+ 6 50 49.84	12.983
* σ^2 Cancri (*mean*)	5.7	8 47 6.262	+ 3.6749	+ 31 1 17.47	13.382
ι Ursæ Majoris	3.0	8 51 11.524	+ 4.1362	+ 48 29 59.99	13.877
12 Year Cat. 1879 S. P.	6.0	8 52 51.429	− 2.5288	+ 99 53 13.99	− 13.700
σ^2 Ursæ Majoris	5.0	9 0 5.001	+ 5.3635	+ 67 36 29.58	14.241
κ Cancri	5.0	9 1 24.597	+ 3.2564	+ 11 8 17.85	14.270
* θ Hydræ	4.0	9 8 16.624	+ 3.1265	+ 2 48 25.47	14.998
* β Argus	1.5	9 11 54.661	+ 0.6797	− 69 14 7.20	14.798
* α Lyncis	3.3	9 13 55.460	+ 3.6708	+ 34 53 10.59	− 15.004
ι Argus	2.0	9 13 57.366	+ 1.6013	− 58 47 3.64	14.988
α Cephei S. P.	2.7	9 15 47.199	+ 1.4370	+117 54 35.72	15.164
1 Draconis (H.)	4.3	9 20 18.611	+ 9.0497	+ 81 50 29.92	15.397
α Hydræ	2.0	9 21 50.281	+ 2.9492	− 8 9 7.69	15.434
d Ursæ Majoris	4.7	9 24 6.883	+ 5.4117	+ 70 20 36.16	− 15.530
θ Ursæ Majoris	3.0	9 25 1.498	+ 4.0447	+ 52 12 34.79	16.196
* 10 Leonis Minoris	4.7	9 27 3.207	+ 3.6960	+ 36 54 58.45	15.762
β Cephei (*pr.*) S. P.	3.0	9 27 8.739	+ 0.7963	+109 57 10.20	15.752
* ο Leonis	3.7	9 34 54.332	+ 3.2075	+ 10 25 26.10	16.205
* ζ Chamæleontis	5.0	9 37 17.254	− 1.5442	− 80 24 54.95	− 16.302
ε Leonis	3.0	9 39 12.523	+ 3.4163	+ 24 18 44.23	16.409
11 Cephei S. P.	5.0	9 40 12.317	+ 0.9033	+109 13 37.71	16.534
μ Leonis	4.0	9 46 6.482	+ 3.4233	+ 26 33 26.46	16.780
* 19 Leonis Minoris	5.3	9 50 30.929	+ 3.6976	+ 41 36 43.54	16.944
79 Draconis S. P.	6.3	9 51 24.523	+ 0.7322	+106 51 4.03	− 17.010
* π Leonis	5.0	9 54 1.807	+ 3.1749	+ 8 36 17.87	17.125
α Leonis (*Regulus*)	1.3	10 2 8.422	+ 3.2013	+ 12 32 18.64	17.461
32 Ursæ Majoris	6.0	10 9 31.477	+ 4.4281	+ 65 41 28.34	17.793
* λ Ursæ Majoris	3.3	10 10 2.197	+ 3.6421	+ 43 29 52.23	17.858
γ^1 Leonis	2.0	10 13 31.263	+ 3.3158	+ 20 25 58.33	− 18.073
* μ Hydræ	4.0	10 20 25.967	+ 2.9004	− 16 14 22.85	18.300
* β Leonis Minoris	4.3	10 21 6.908	+ 3.4885	+ 37 18 22.55	18.302
* α Antliæ	4.0	10 21 47.905	+ 2.7385	− 30 28 22.32	18.208
9 Draconis (H.)	4.7	10 25 7.368	+ 5.2806	+ 76 18 53.82	18.375
ρ Leonis	4.0	10 26 39.033	+ 3.1647	+ 9 54 29.55	− 18.421
226 Cephei (B.) S. P.	5.3	10 30 12.987	+ 1.0796	+104 22 35.33	18.526
* 41 Leonis Minoris	5.7	10 37 3.185	+ 3.2718	+ 23 48 1.84	18.729
η Argus (*var.*)	1—6	10 40 31.400	+ 2.3120	− 59 4 10.63	18.864
l Leonis	5.3	10 43 6.433	+ 3.1590	+ 11 9 50.21	− 18.964

* Apparent places of stars marked with an asterisk are not given in this Ephemeris.

MEAN PLACES FOR 1883.0. (January 0d.0—0d.015, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* δ^2 Chamæleontis . . .	5.0	10 44 40.054	+ 0.6139	− 79 55 23.70	− 19.000
ι Cephei . . . . S. P.	3.3	10 45 30.953	2.1204	+114 24 53.47	18.871
* 46 Leonis Minoris . .	4.0	10 46 45.968	3.3712	+ 34 50 43.53	19.286
* Groombridge 1706 .	6.0	10 50 33.491	4.9902	+ 78 23 47.69	19.168
α Ursæ Majoris . . .	2.0	10 56 29.891	+ 3.7528	+ 62 22 56.51	19.355
* η Octantis	6.0	11 0 5.148	− 0.2755	− 83 57 52.68	− 19.410
* p^3 Leonis	6.0	11 0 56.134	+ 3.0622	+ 2 35 24.85	19.481
* ψ Ursæ Majoris . . .	3.3	11 3 4.911	3.3957	+ 45 7 58.12	19.497
δ Leonis	2.3	11 7 53.110	3.1991	+ 21 9 52.19	19.679
* ν Ursæ Majoris . . .	3.3	11 12 9.545	3.2591	+ 33 43 57.09	19.568
δ Crateris.	3.3	11 13 29.521	+ 2.9959	− 14 8 44.37	− 19.459
ο Cephei . . . . S. P.	5.3	11 13 49.567	2.4413	+112 31 42.44	19.666
τ Leonis	5.0	11 21 55.211	3.0862	+ 3 30 1.58	19.799
λ Draconis	3.3	11 24 26.625	3.6285	+ 69 58 35.99	19.834
* ξ Hydræ	4.0	11 27 14.885	2.9419	− 31 12 17.76	19.883
υ Leonis	5.0	11 30 57.503	+ 3.0712	− 0 10 40.58	− 19.858
γ Cephei . : . . S. P.	3.3	11 34 33.073	2.4106	+103 1 14.55	20.074
* χ Ursæ Majoris . . .	3.7	11 39 52.137	3.1949	+ 48 25 40.98	19.960
β Leonis	2.0	11 43 5.482	3.0645	+ 15 13 33.68	20.118
γ Ursæ Majoris . . .	2.3	11 47 40.382	3.1846	+ 54 20 42.64	20.026
Groombr. 4163 . S. P.	7.0	11 49 9.173	+ 2.8593	+106 14 26.79	− 20.022
* π Virginis.	4.3	11 54 52.625	3.0752	+ 7 16 0.24	20.088
ο Virginis.	4.0	11 59 14.936	3.0578	+ 9 22 58.24	20.016
* ε Corvi	3.0	12 4 6.599	3.0787	− 21 58 9.50	20.042
4 Draconis (H.) . . .	4.7	12 6 42.564	2.8936	+ 78 15 59.14	20.024
γ Corvi	2.0	12 9 47.412	+ 3.0788	− 16 53 32.07	− 20.019
* 2 Canum Venaticorum	5.3	12 10 15.666	3.0235	+ 41 18 41.92	20.067
β Chamæleontis . . .	5.0	12 11 30.518	3.3884	− 78 39 44.40	20.000
η Virginis	3.3	12 13 55.220	3.0684	− 0 0 59.61	20.044
* 6 Ursæ Minoris . . .	6.0	12 14 19.510	0.0920	+ 88 20 55.03	19.941
α^1 Crucis	1.0	12 20 5.194	+ 3.2732	− 62 27 1.92	− 20.018
* δ^2 Corvi	2.3	12 23 48.775	3.1018	− 15 51 49.41	20.088
* β Canum Venaticorum	4.3	12 28 11.095	2.8608	+ 41 59 36.01	19.619
β Corvi	2.3	12 28 14.560	3.1405	− 22 44 58.51	19.966
κ Draconis	3.3	12 28 29.071	2.5953	+ 70 25 59.69	19.893
* γ Virginis (*mean*) . .	2.7	12 35 43.944	+ 3.0380	− 0 48 27.70	− 19.817
21 Cassiopeæ . . . S. P.	6.0	12 37 56.251	3.8471	+105 39 6.22	19.758
* 31 Coronæ Borealis . .	5.0	12 46 0.012	2.9308	+ 28 10 38.92	19.667
32^2 Camelopardalis (H.).	4.7	12 48 16.753	0.3788	+ 84 2 55.94	19.597
* γ Cassiopeæ . . . S. P.	2.0	12 49 39.241	3.5743	+119 55 2.01	19.571
α Canum Venaticorum	2.7	12 50 33.249	+ 2.8164	+ 38 57 1.54	− 19.519
* 43 Cephei (H.) . . S. P.	4.3	12 52 57.830	7.1460	+ 94 22 16.56	19.520
* δ Muscæ	4.0	12 54 14.409	4.0242	− 70 55 1.74	19.483
* ε Virginis.	2.7	12 56 21.187	2.9880	+ 11 35 17.56	19.425
θ Virginis.	4.3	13 3 53.544	3.1007	− 4 54 50.70	19.321
* 20 Canum Venaticorum	4.7	13 12 17.718	+ 2.6976	+ 41 11 19.77	− 19.044
α Urs. Min. (*Polaris*) S. P.	2.0	13 15 52.079	22.1290	+ 91 18 54.09	18.964
α Virginis (*Spica*) . .	1.0	13 19 1.792	3.1529	− 10 33 1.02	18.911
* κ Octantis.	5.0	13 22 14.256	8.5714	− 85 11 6.09	18.809
38 Cassiopeæ . . . S. P.	6.3	13 22 32.314	+ 4.3685	+110 20 17.50	− 18.692

* Apparent places of stars marked with an asterisk are not given in this Ephemeris.

MEAN PLACES FOR 1883.0. (January 0^d.0—0^d.015, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
ζ Virginis	3.3	13 28 43.905	+ 3.0527	+ 0 0 9.75	− 18.530
* B. A. C. 4536	5.0	13 29 34.290	+ 2.6829	+ 37 46 55.61	18.549
* *m* Virginis	6.0	13 35 28.318	+ 3.1426	− 8 6 43.62	18.302
η Ursæ Majoris	2.0	13 42 55.810	+ 2.3719	+ 49 53 51.03	18.090
η Bootis	3.0	13 49 6.840	+ 2.8568	+ 18 59 4.88	18.184
50 Cassiopeæ . . . S. P.	4.0	13 53 27.803	+ 4.9990	+ 108 8 44.69	− 17.670
* θ Apodis	5.0	13 53 58.174	+ 5.6551	− 76 13 50.27	17.618
β Centauri	1.0	13 55 34.425	+ 4.1724	− 59 48 28.11	17.611
* π Hydræ	3.7	13 59 42.730	+ 3.4060	− 26 7 5.86	17.520
α Draconis	3.3	14 1 13.365	+ 1.6235	+ 64 56 6.83	17.308
* *d* Bootis	5.0	14 5 3.802	+ 2.7389	+ 25 38 46.95	− 17.215
* κ Virginis	4.3	14 6 39.336	+ 3.1931	− 9 43 42.88	16.945
* δ Octantis	5.0	14 8 18.714	+ 8.9127	− 83 7 47.30	17.004
* 4 Ursæ Minoris	5.0	14 9 19.313	− 0.3327	+ 78 5 50.40	16.909
α Bootis (*Arcturus*)	1.0	14 10 19.510	+ 2.7348	+ 19 47 31.33	18.898
* λ Bootis	4.0	14 11 56.128	+ 2.2830	+ 46 37 33.48	− 16.672
* λ Virginis	4.7	14 12 46.806	+ 3.2368	− 12 49 54.99	16.767
ι Cassiopeæ . . . S. P.	4.0	14 19 26.142	+ 4.8538	+ 113 7 28.92	16.460
θ Bootis	4.0	14 21 12.875	+ 2.0443	+ 52 23 30.87	16.774
ρ Bootis	3.7	14 26 47.310	+ 2.5878	+ 30 53 7.75	15.976
5 Ursæ Minoris	4.7	14 27 47.155	− 0.1979	+ 76 12 57.93	− 16.011
α^2 Centauri	1.0	14 31 40.738	+ 4.0413	− 60 21 14.92	15.398
* α Apodis	4.7	14 33 23.103	+ 7.1544	− 78 32 45.53	15.743
* 33 Bootis	5.3	14 34 28.968	+ 2.2344	+ 44 54 35.45	15.725
ε Bootis	2.3	14 39 52.693	+ 2.6214	+ 27 34 4.89	15.359
α^2 Libræ	2.3	14 44 24.399	+ 3.3085	− 15 33 17.29	− 15.190
* 47 Cephei (H.) . . S. P.	6.0	14 50 34.871	+ 7.6924	+ 101 2 44.83	14.744
β Ursæ Minoris	2.0	14 51 3.464	− 0.2376	+ 74 38 1.08	14.718
* γ Scorpii	3.3	14 57 13.481	+ 3.5007	− 24 49 16.12	14.380
β Bootis	3.0	14 57 32.357	+ 2.2601	+ 40 51 9.18	14.377
48 Cephei (H.) . . S. P.	6.3	15 5 30.923	+ 7.3840	+ 102 41 50.30	− 13.782
β Libræ	2.0	15 10 42.703	+ 3.2210	− 8 57 1.37	13.533
* δ Bootis	3.0	15 10 47.180	+ 2.4208	+ 33 45 7.36	13.602
* ρ Octantis	6.0	15 16 30.324	+ 12.8892	− 84 4 15.89	13.069
μ^1 Bootis	4.0	15 20 4.254	+ 2.2661	+ 37 47 17.26	12.798
γ^2 Ursæ Minoris	3.0	15 20 55.361	− 0.1384	+ 72 15 1.14	− 12.810
* β Coronæ Borealis	4.0	15 23 0.332	+ 2.4750	+ 29 30 34.35	12.614
α Coronæ Borealis	2.0	15 29 44.080	+ 2.5391	+ 27 6 32.85	12.326
* γ Camelop. (H.) . . S. P.	4.3	15 38 1.485	+ 6.2281	+ 109 1 48.96	11.594
α Serpentis	2.3	15 38 30.326	+ 2.9512	+ 6 47 40.16	11.575
ε Serpentis	3.3	15 44 59.061	+ 2.9867	+ 4 49 50.91	− 11.074
ζ Ursæ Minoris	4.3	15 48 15.743	− 2.2644	+ 78 9 13.63	10.904
ε Coronæ Borealis	4.0	15 52 44.693	+ 2.4830	+ 27 13 2.59	10.633
δ Scorpii	2.3	15 53 24.996	+ 3.5377	− 22 17 15.24	10.558
β^1 Scorpii	2.0	15 58 38.109	+ 3.4799	− 19 29 2.85	10.168
* δ^1 Apodis	5.3	16 2 54.315	+ 8.7342	− 78 23 50.66	− 9.782
* φ Herculis	4.0	16 5 4.865	+ 1.8810	+ 45 14 31.87	9.598
Groombridge 2320	6.3	16 6 0.213	+ 0.1372	+ 68 7 6.63	9.499
δ Ophiuchi	3.0	16 8 12.887	+ 3.1391	− 3 23 31.44	9.541
* σ Coronæ Borealis (*mean*)	5.7	16 10 17.780	+ 2.2445	+ 34 9 21.01	− 9.276

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MEAN PLACES FOR 1883.0. (January 0d.0—0d.015, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* γ Apodis	4.3	16 15 32.454	+ 8.9895	− 78 37 50.68	− 8.827
τ Herculis	3.3	16 16 13.482	+ 1.8007	+ 46 35 32.71	8.751
* η Ursæ Minoris	5.0	16 20 56.211	− 1.8238	+ 76 1 28.05	8.146
α Scorpii (*Antares*)	1.3	16 22 14.079	+ 3.6692	− 26 10 16.01	8.335
η Draconis	2.7	16 22 24.614	+ 0.8051	+ 61 46 45.25	8.229
β Herculis	2.3	16 25 11.434	+ 2.5773	+ 21 44 43.46	− 8.079
* A Draconis	5.0	16 28 13.128	− 0.1376	+ 69 1 15.91	7.797
ζ Ophiuchi	2.7	16 30 43.011	+ 3.2985	− 10 19 44.46	7.575
α Trianguli Australis	2.0	16 36 17.274	+ 6.2972	− 68 48 37.38	7.217
η Herculis	3.3	16 38 53.088	+ 2.0535	+ 39 8 43.48	7.040
α Camelopardalis . S. P.	4.7	16 42 25.355	+ 5.9206	+113 51 29.75	− 6.658
κ Ophiuchi	3.3	16 52 7.843	+ 2.8372	+ 9 33 28.46	5.858
d Herculis	5.0	16 57 17.206	+ 2.2111	+ 33 44 18.31	5.417
ε Ursæ Minoris	4.3	16 57 59.995	− 6.3515	+ 82 13 39.88	5.362
* η Ophiuchi	2.7	17 3 40.088	+ 3.4365	− 15 34 43.84	4.770
α¹ Herculis (*var.*)	3.5	17 9 18.772	+ 2.7333	+ 14 31 28.66	− 4.373
* π Herculis	3.0	17 10 58.349	+ 2.0889	+ 36 56 29.95	4.249
* θ Ophiuchi	3.3	17 14 49.470	+ 3.6786	− 24 52 53.13	3.978
b Ophiuchi (*var.*)	5.0	17 19 13.530	+ 3.6586	− 24 3 58.66	3.680
* δ Aræ	4.0	17 20 32.491	+ 5.3995	− 65 35 3.56	3.576
Groombr. 966 . . S. P.	6.3	17 24 5.565	+ 7.9959	+105 2 12.04	− 3.148
* Groombr. 944 . . S. P.	6.3	17 24 37.900	+18.6130	+ 94 51 58.47	3.094
β Draconis	2.7	17 27 47.398	+ 1.3531	+ 52 23 18.03	2.810
α Ophiuchi	2.0	17 29 30.220	+ 2.7826	+ 12 38 46.13	2.898
* ι Herculis	3.3	17 36 9.824	+ 1.6964	+ 46 4 8.68	2.094
ω Draconis	5.0	17 37 38.281	− 0.3545	+ 68 48 42.72	− 1.630
μ Herculis	3.3	17 41 52.815	+ 2.3461	+ 27 47 23.32	2.343
ψ¹ Draconis	4.3	17 44 1.235	− 1.0803	+ 72 12 20.93	1.670
* θ Herculis	4.0	17 52 14.424	+ 2.0550	+ 37 16 0.00	0.660
γ Draconis	2.3	17 53 53.374	+ 1.3913	+ 51 30 10.86	0.565
γ² Sagittarii	3.3	17 58 17.527	+ 3.8514	− 30 25 26.66	− 0.368
* ο Herculis	4.0	18 2 58.731	+ 2.3393	+ 28 44 49.65	+ 0.263
22 Camelop. (H.) . . S. P.	4.7	18 5 56.879	+ 6.6179	+110 38 29.72	0.638
μ Sagittarii	4.0	18 6 45.991	+ 3.5865	− 21 5 17.13	0.580
δ Ursæ Minoris	4.3	18 10 3.844	−19.4475	+ 86 36 35.94	0.931
η Serpentis	3.0	18 15 15.360	+ 3.1022	− 2 55 40.38	+ 0.660
* λ Sagittarii	3.0	18 20 44.999	+ 3.7027	− 25 29 6.08	1.604
* χ Draconis	4.0	18 23 9.891	− 1.0789	+ 72 40 53.98	1.647
1 Aquilæ	4.3	18 28 50.420	+ 3.2645	− 8 19 29.26	2.187
* ζ Pavonis	4.0	18 29 21.467	+ 7.0318	− 71 31 30.56	2.420
σ Octantis	6.0	18 29 54.970	+107.7100	− 89 16 23.08	+ 2.590
α Lyræ (*Vega*)	1.0	18 32 58.647	+ 2.0313	+ 38 40 31.25	3.149
51 Cephei (H.) . . S. P.	5.3	18 45 15.606	+30.0575	+ 92 46 26.49	4.028
β Lyræ (*var.*)	4.0	18 45 45.638	+ 2.2141	+ 33 13 38.79	3.960
σ Sagittarii	2.3	18 48 0.617	+ 3.7220	− 26 26 26.46	4.093
50 Draconis	6.0	18 50 8.402	− 1.9045	+ 75 17 43.17	+ 4.427
* γ Lyræ	3.3	18 54 34.036	+ 2.2442	+ 32 31 47.20	4.741
ζ Aquilæ	3.0	19 0 1.967	+ 2.7569	+ 13 41 25.60	5.089
* ι Lyræ	5.0	19 3 7.637	+ 2.1411	+ 35 55 2.64	5.463
* 25 Camelopardalis . S. P.	4.7	19 6 23.837	+12.9900	+ 97 22 2.79	+ 5.760

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MEAN PLACES FOR 1883.0. (January 0^d.0—0^d.015, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
d Sagittarii	5.0	19 10 47.339	+ 3.5127	− 19 9 35.63	+ 6.078
* θ Lyræ	4.3	19 12 18.397	+ 2.0789	+ 37 55 33.09	6.224
δ Draconis	3.0	19 12 31.528	+ 0.0310	+ 67 27 20.66	6.326
τ Draconis	4.7	19 17 47.828	− 1.1132	+ 73 8 16.40	6.786
Piazzi vii. 67 S. P.	6.0	19 18 41.881	+ 6.3041	+111 17 50.93	6.788
δ Aquilæ	3.3	19 19 35.951	+ 3.0253	+ 2 52 56.88	+ 6.902
* β Cygni	3.0	19 26 0.188	+ 2.4193	+ 27 42 52.71	7.342
κ Aquilæ	5.0	19 30 35.801	+ 3.2292	− 7 17 11.43	7.723
* β Sagittæ	4.3	19 35 47.648	+ 2.6955	+ 17 12 20.23	8.112
γ Aquilæ	3.0	19 40 41.844	+ 2.8522	+ 10 19 44.36	8.522
λ Ursæ Minoris	6.3	19 41 2.947	−63.0270	+ 88 57 2.65	+ 8.568
* δ Cygni	2.7	19 41 19.116	+ 1.8761	+ 44 50 44.36	8.615
α Aquilæ (*Altair*)	1.3	19 45 4.493	+ 2.9277	+ 8 33 36.59	9.246
* Groombr. 1374 S. P.	5.7	19 46 9.956	+ 7.2975	+105 46 19.04	8.994
* ε Pavonis	4.0	19 47 2.855	+ 7.0527	− 73 12 59.71	8.922
ε Draconis	3.7	19 48 33.701	− 0.1764	+ 69 58 11.79	+ 9.175
β Aquilæ	4.0	19 49 33.972	+ 2.9471	+ 6 6 55.26	8.735
* γ Sagittæ	3.7	19 53 33.248	+ 2.6678	+ 19 10 30.59	9.572
* *c* Sagittarii	5.0	19 55 27.696	+ 3.6959	− 28 2 2.22	9.672
τ Aquilæ	6.0	19 58 25.498	+ 2.9332	+ 6 56 54.77	9.915
3 Ursæ Majoris (H.) S.P.	5.7	20 1 9.464	+ 6.0567	+111 11 0.46	+ 10.112
* θ Aquilæ	3.0	20 5 16.040	+ 3.0975	− 1 10 3.83	10.432
* ο^1 Cygni	4.3	20 9 56.860	+ 1.8893	+ 46 23 12.86	10.774
α^2 Capricorni	3.0	20 11 33.755	+ 3.3327	− 12 54 23.44	10.890
κ Cephei (*pr.*)	4.3	20 12 48.386	− 1.9124	+ 77 21 30.58	11.009
α Pavonis	2.0	20 16 23.479	+ 4.7879	− 57 6 30.10	+ 11.151
γ Cygni	2.3	20 18 1.861	+ 2.1536	+ 39 52 57.59	11.354
π Capricorni	5.0	20 20 37.433	+ 3.4403	− 18 35 39.55	11.530
ε Delphini	4.0	20 27 37.421	+ 2.8673	+ 10 54 23.22	12.020
Groombridge 3241	6.3	20 30 30.186	− 0.2155	+ 72 8 6.79	12.223
* α Delphini	3.7	20 34 12.211	+ 2.7878	+ 15 29 59.77	+ 12.500
* β Pavonis	3.0	20 34 24.110	+ 5.4813	− 66 37 18.29	12.488
α Cygni	1.7	20 37 26.628	+ 2.0442	+ 44 51 45.57	12.710
* ψ Capricorni	4.3	20 39 9.925	+ 3.5596	− 25 41 25.49	12.664
* ε Cygni	2.7	20 41 28.646	+ 2.4273	+ 33 31 56.73	13.322
μ Aquarii	4.7	20 46 20.574	+ 3.2403	− 9 25 17.62	+ 13.267
ν Cygni	4.0	20 52 48.696	+ 2.2339	+ 40 43 1.81	13.710
12 Year Cat. 1879	6.0	20 52 51.429	− 2.5288	+ 80 6 46.01	13.700
σ^2 Ursæ Majoris S. P.	5.0	21 0 5.001	+ 5.3635	+112 23 30.42	14.241
61^1 Cygni	5.0	21 1 39.181	+ 2.6829	+ 38 10 28.48	17.512
ζ Cygni	3.0	21 7 57.399	+ 2.5494	+ 29 44 50.91	+ 14.596
* τ Cygni	4.0	21 10 7.276	+ 2.3931	+ 37 32 46.95	15.248
α Cephei	2.7	21 15 47.199	+ 1.4370	+ 62 5 24.28	15.164
1 Pegasi	4.3	21 16 40.527	+ 2.7721	+ 19 18 16.07	15.225
* ζ Capricorni	4.0	21 19 59.103	+ 3.4337	− 22 55 2.32	15.380
1 Draconis (H.) S. P.	4.3	21 20 18.611	+ 9.0497	+ 98 9 30.08	+ 15.397
d Ursæ Majoris S. P.	4.7	21 24 6.883	+ 5.4117	+109 39 23.84	15.530
β Aquarii	3.0	21 25 23.966	+ 3.1622	− 6 5 7.01	15.644
β Cephei (*pr.*)	3.0	21 27 8.739	+ 0.7963	+ 70 2 49.80	15.752
ξ Aquarii	5.0	21 31 31.404	+ 3.1985	− 8 22 41.83	+ 15.955

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MEAN PLACES FOR 1883.0. (January $0^d.0$—$0^d.015$, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
* 74 Cygni	5.0	21	32	15.601	+ 7.4010	+ 39	53	17.32	+ 16.039
* λ^1 Octantis.	5.3	21	32	49.524	9.8589	— 83	15	18.28	15.983
ε Pegasi	2.3	21	38	26.398	2.9467	+ 9	20	20.81	16.342
11 Cephei	5.0	21	40	12.317	0.9033	+ 70	46	22.29	16.534
* π^2 Cygni	4.3	21	42	28.290	2.2127	+ 48	46	6.98	16.532
μ Capricorni	5.0	21	46	54.994	+ 3.2768	— 14	6	6.99	+ 16.764
* 16 Pegasi	5.3	21	47	44.327	2.7275	+ 25	22	30.23	16.806
79 Draconis	6.3	21	51	24.523	0.7322	+ 73	8	55.97	17.010
α Aquarii	3.0	21	59	46.467	3.0830	— 0	53	16.01	17.343
α Gruis	2.0	22	0	51.239	3.8090	— 47	31	36.40	17.232
* π Pegasi	4.0	22	4	47.517	+ 2.6595	+ 32	36	16.32	+ 17.569
* υ Octantis	6.0	22	8	51.980	13.3991	— 86	33	37.08	17.832
32 Ursæ Majoris . . S. P.	6.0	22	9	31.477	4.4281	+114	18	31.66	17.793
θ Aquarii	4.3	22	10	39.565	3.1696	— 8	21	55.55	17.790
* γ Aquarii	3.3	22	15	36.754	3.1011	— 1	58	35.58	18.028
π Aquarii	4.7	22	19	18.124	+ 3.0649	+ 0	47	2.73	+ 18.144
* σ Aquarii	5.0	22	24	27.220	3.1763	— 11	16	34.47	18.308
9 Draconis (H.) . . S. P.	4.7	22	25	7.368	5.2806	+108	41	6.18	18.375
* α Lacertæ.	4.0	22	26	28.341	2.4611	+ 49	40	52.30	18.407
η Aquarii	4.0	22	29	20.646	3.0838	— 0	43	12.68	18.448
226 Cephei (B.) . . .	5.3	22	30	12.987	+ 1.0796	+ 75	37	24.67	+ 18.526
* 10 Lacertæ	5.0	22	34	0.732	2.6856	+ 38	26	29.59	18.661
* β Octantis.	4.7	22	34	0.951	6.5260	— 81	59	38.03	18.663
ζ Pegasi	3.3	22	35	37.631	2.9908	+ 10	13	15.30	18.697
* λ Pegasi	4.0	22	40	53.766	2.8846	+ 22	57	0.72	18.866
ι Cephei	3.3	22	45	30.953	+ 2.1204	+ 65	35	6.53	+ 18.871
λ Aquarii	4.0	22	46	30.640	3.1332	— 8	12	6.60	19.067
* Groombr. 1706 . S. P.	6.0	22	50	33.491	4.9902	+101	36	12.31	19.168
α Pis. Aus. (*Fomalhaut*)	1.3	22	51	11.003	3.3262	— 30	14	31.25	18.985
α Ursæ Majoris . . S. P.	2.0	22	56	29.891	3.7528	+117	37	3.49	19.355
* ο Andromedæ . . .	3.7	22	56	32.351	+ 2.7487	+ 41	41	50.01	+ 19.281
α Pegasi (*Markab*) . .	2.0	22	58	56.001	2.9846	+ 14	34	33.33	19.295
* φ Aquarii	4.3	23	8	15.795	3.1091	— 6	40	46.12	19.353
ο Cephei	5.3	23	13	49.567	2.4413	+ 67	28	17.56	19.666
* τ Pegasi	4.7	23	14	50.801	2.9628	+ 28	5	59.79	19.651
θ Piscium	4.7	23	22	1.994	+ 3.0409	+ 5	44	10.78	+ 19.723
λ Draconis . . . S. P.	3.3	23	24	26.625	3.6285	+110	1	24.01	19.834
* λ Andromedæ . . .	4.0	23	31	50.417	2.9203	+ 45	49	26.70	19.469
ι Piscium	4.3	23	33	55.967	3.0839	+ 4	59	32.02	19.481
γ Cephei	3.3	23	34	33.073	2.4106	+ 76	58	45.45	20.074
* ι^1 Aquarii	5.0	23	38	7.981	+ 3.1176	— 18	55	34.16	+ 19.957
* δ Sculptoris	4.3	23	42	49.847	3.1335	— 58	46	36.91	19.855
* γ^1 Octantis.	5.3	23	45	11.466	3.7105	— 82	40	8.58	19.990
Groombridge 4163 .	7.0	23	49	9.173	2.8593	+ 73	45	33.21	20.022
ω Piscium	4.0	23	53	18.224	3.0781	+ 6	12	55.91	19.930
* 33 Piscium	5.0	23	59	20.815	+ 3.0710	— 6	21	43.33	+ 20.144

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* Apparent places of stars marked with an asterisk are not given in this Ephemeris.

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Jan.	h m 1 15	+88° 41′	Jan.	h m 6 45	+87° 13′	Jan.	h m 18 9	+86° 36′	Jan.	h m 19 39	+88° 57′
	s	″		s	″		s	″		s	″
0.3	86.06	28.9	0.5	49.96	25.3	1.0	36.17	40.0	1.1	44.48	16.2
1.3	85.17	29.0	1.5	49.99	25.6	2.0	36.20	39.7	2.0	44.14	15.9
2.3	84.32	29.0	2.5	50.04	25.9	3.0	36.23	39.4	3.0	43.79	15.6
3.3	83.52	29.1	3.5	50.09	26.1	4.0	36.25	39.1	4.0	43.40	15.3
4.3	82.72	29.2	4.5	50.16	26.4	5.0	36.27	38.8	5.0	42.99	15.1
5.3	81.92	29.3	5.5	50.24	26.7	6.0	36.27	38.5	6.0	42.55	14.8
6.3	81.09	29.4	6.5	50.34	27.0	7.0	36.28	38.2	7.0	42.08	14.5
7.3	80.21	29.5	7.5	50.44	27.3	8.0	36.28	37.8	8.0	41.61	14.2
8.3	79.28	29.6	8.5	50.53	27.7	9.0	36.30	37.5	9.0	41.17	13.9
9.2	78.29	29.6	9.5	50.59	28.0	9.9	36.33	37.1	10.0	40.77	13.5
10.2	77.25	29.7	10.5	50.62	28.4	10.9	36.40	36.7	11.0	40.46	13.2
11.2	76.21	29.8	11.5	50.63	28.7	11.9	36.48	36.4	12.0	40.22	12.8
12.2	75.17	29.8	12.5	50.61	29.1	12.9	36.59	36.0	13.0	40.06	12.5
13.2	74.17	29.8	13.5	50.56	29.4	13.9	36.72	35.7	14.0	39.96	12.1
14.2	73.20	29.8	14.5	50.49	29.7	14.9	36.84	35.4	15.0	39.90	11.8
15.2	72.31	29.8	15.5	50.43	30.0	15.9	36.96	35.1	16.0	39.85	11.5
16.2	71.46	29.7	16.4	50.36	30.3	16.9	37.07	34.8	17.0	39.79	11.2
17.2	70.63	29.7	17.4	50.30	30.6	17.9	37.17	34.5	18.0	39.70	10.9
18.2	69.83	29.7	18.4	50.26	30.8	18.9	37.27	34.3	19.0	39.57	10.6
19.2	69.01	29.7	19.4	50.24	31.1	19.9	37.36	34.0	20.0	39.42	10.3
20.2	68.17	29.7	20.4	50.22	31.4	20.9	37.46	33.7	21.0	39.26	10.0
21.2	67.27	29.7	21.4	50.19	31.7	21.9	37.57	33.4	22.0	39.13	9.7
22.2	66.32	29.7	22.4	50.14	32.0	22.9	37.70	33.0	23.0	39.04	9.4
23.2	65.32	29.7	23.4	50.07	32.4	23.9	37.85	32.7	24.0	39.01	9.0
24.2	64.29	29.7	24.4	49.96	32.7	24.9	38.02	32.3	25.0	39.08	8.7
25.2	63.24	29.7	25.4	49.82	33.1	25.9	38.22	32.0	26.0	39.21	8.3
26.2	62.22	29.6	26.4	49.65	33.4	26.9	38.44	31.7	27.0	39.44	8.0
27.2	61.24	29.5	27.4	49.45	33.7	27.9	38.66	31.4	28.0	39.73	7.6
28.2	60.30	29.4	28.4	49.24	34.0	28.9	38.88	31.2	29.0	40.02	7.3
29.2	59.44	29.2	29.4	49.03	34.3	29.9	39.10	30.9	30.0	40.32	7.0
30.2	58.62	29.1	30.4	48.83	34.5	30.9	39.31	30.7	31.0	40.61	6.7
31.2	57.85	29.0	31.4	48.65	34.8	31.9	39.51	30.4	32.0	40.88	6.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Feb.	$1^{h}\ 15^{m}$	$+88^{\circ}\ 41'$	Feb.	$6^{h}\ 45^{m}$	$+87^{\circ}\ 13'$	Feb.	$18^{h}\ 9^{m}$	$+86^{\circ}\ 36'$	Feb.	$19^{h}\ 39^{m}$	$+88^{\circ}\ 56'$
1.2	$57^{s}.08$	$28''.9$	1.4	$48^{s}.49$	$35''.0$	1.9	$39^{s}.70$	$30''.2$	1.0	$40^{s}.88$	$66''.4$
2.2	56.30	28.8	2.4	48.34	35.3	2.9	39.90	30.0	2.0	41.09	66.2
3.2	55.48	28.7	3.4	48.19	35.6	3.9	40.09	29.7	3.0	41.27	65.9
4.2	54.62	28.7	4.4	48.04	35.8	4.9	40.28	29.4	4.0	41.45	65.6
5.2	53.73	28.6	5.4	47.88	36.1	5.9	40.49	29.1	5.0	41.65	65.3
6.2	52.79	28.5	6.4	47.70	36.4	6.9	40.73	28.8	6.0	41.89	64.9
7.2	51.83	28.4	7.4	47.47	36.7	7.9	40.99	28.6	6.9	42.18	64.6
8.2	50.88	28.2	8.4	47.22	37.0	8.9	41.26	28.3	7.9	42.57	64.2
9.2	49.96	28.1	9.4	46.93	37.3	9.9	41.55	28.0	8.9	43.02	63.9
10.2	49.09	27.9	10.4	46.64	37.6	10.9	41.84	27.8	9.9	43.55	63.6
11.2	48.29	27.7	11.4	46.34	37.8	11.9	42.13	27.6	10.9	44.12	63.3
12.2	47.56	27.5	12.4	46.04	38.0	12.9	42.42	27.4	11.9	44.71	63.0
13.2	46.87	27.3	13.4	45.76	38.3	13.9	42.69	27.3	12.9	45.30	62.7
14.2	46.22	27.1	14.4	45.48	38.5	14.9	42.95	27.1	13.9	45.86	62.5
15.1	45.57	27.0	15.4	45.23	38.7	15.9	43.21	26.9	14.9	46.38	62.2
16.1	44.91	26.8	16.4	44.99	38.9	16.9	43.46	26.7	15.9	46.87	62.0
17.1	44.21	26.7	17.4	44.74	39.1	17.8	43.73	26.5	16.9	47.34	61.7
18.1	43.46	26.5	18.4	44.48	39.3	18.8	44.01	26.3	17.9	47.82	61.5
19.1	42.68	26.3	19.4	44.20	39.6	19.8	44.29	26.1	18.9	48.32	61.2
20.1	41.85	26.1	20.4	43.89	39.8	20.8	44.60	25.9	19.9	48.87	60.9
21.1	41.01	25.9	21.4	43.55	40.1	21.8	44.94	25.6	20.9	49.51	60.6
22.1	40.20	25.7	22.4	43.18	40.3	22.8	45.30	25.4	21.9	50.23	60.3
23.1	39.43	25.4	23.4	42.79	40.5	23.8	45.66	25.3	22.9	51.02	60.0
24.1	38.74	25.2	24.3	42.38	40.7	24.8	46.02	25.1	23.9	51.86	59.7
25.1	38.10	24.9	25.3	41.97	40.9	25.8	46.38	25.0	24.9	52.75	59.4
26.1	37.51	24.6	26.3	41.57	41.1	26.8	46.72	24.9	25.9	53.64	59.2
27.1	36.97	24.4	27.3	41.18	41.2	27.8	47.06	24.8	26.9	54.52	59.0
28 1	36.47	24.1	28.3	40.82	41.3	28.8	47.38	24.7	27.9	55.36	58.8
29.1	35.98	23.9	29.3	40.47	41.5	29.8	47.69	24.6	28.9	56.17	58.6
									29.9	56.93	58.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Mar.	h m 1 15	+88° 41′	Mar.	h m 6 45	+87° 13′	Mar.	h m 18 9	+86° 36′	Mar.	h m 19 39	+88° 56′
	s	″		s	″		s	″		s	″
1.1	35.98	23.9	1.3	40.47	41.5	1.8	47.69	24.6	1.9	56.93	58.4
2.1	35.48	23.7	2.3	40.15	41.6	2.8	48.00	24.5	2.9	57.66	58.2
3.1	34.94	23.5	3.3	39.84	41.8	3.8	48.31	24.4	3.9	58.38	58.0
4.1	34.36	23.2	4.3	39.51	42.0	4.8	48.63	24.2	4.9	59.13	57.8
5.1	33.75	23.0	5.3	39.16	42.1	5.8	48.97	24.1	5.9	59.93	57.5
6.1	33.12	22.8	6.3	38.78	42.3	6.8	49.33	24.0	6.9	60.80	57.3
7.1	32.49	22.5	7.3	38.39	42.5	7.8	49.69	23.8	7.9	61.74	57.0
8.1	31.89	22.2	8.3	37.97	42.6	8.8	50.08	23.7	8.9	62.74	56.8
9.1	31.35	21.9	9.3	37.52	42.8	9.8	50.47	23.6	9.9	63.78	56.6
10.1	30.86	21.6	10.3	37.06	43.0	10.8	50.86	23.6	10.9	64.86	56.4
11.1	30.46	21.3	11.3	36.62	43.0	11.8	51.23	23.5	11.9	65.93	56.3
12.1	30.12	21.0	12.3	36.17	43.1	12.8	51.59	23.5	12.9	66.99	56.1
13.1	29.82	20.7	13.3	35.76	43.1	13.8	51.94	23.5	13.9	67.99	56.0
14.1	29.56	20.4	14.3	35.37	43.2	14.8	52.28	23.5	14.9	68.95	55.9
15.1	29.29	20.1	15.3	35.01	43.2	15.8	52.60	23.5	15.8	69.86	55.7
16.1	29.01	19.9	16.3	34.64	43.3	16.8	52.93	23.4	16.8	70.75	55.6
17.1	28.68	19.6	17.3	34.27	43.4	17.8	53.27	23.4	17.8	71.65	55.5
18.1	28.31	19.3	18.3	33.89	43.5	18.8	53.62	23.3	18.8	72.59	55.3
19.1	27.92	19.0	19.3	33.48	43.6	19.8	53.98	23.3	19.8	73.60	55.1
20.1	27.50	18.7	20.3	33.05	43.7	20.8	54.35	23.2	20.8	74.67	54.9
21.1	27.10	18.4	21.3	32.59	43.8	21.8	54.75	23.2	21.8	75.82	54.8
22.0	26.74	18.1	22.3	32.12	43.9	22.8	55.16	23.2	22.8	77.03	54.6
23.0	26.44	17.8	23.3	31.62	43.9	23.8	55.57	23.2	23.8	78.27	54.5
24.0	26.22	17.4	24.3	31.12	43.9	24.7	55.98	23.2	24.8	79.51	54.4
25.0	26.06	17.0	25.3	30.63	43.9	25.7	56.36	23.3	25.8	80.74	54.3
26.0	25.95	16.7	26.3	30.17	43.9	26.7	56.73	23.4	26.8	81.94	54.3
27.0	25.89	16.4	27.3	29.73	43.9	27.7	57.07	23.4	27.8	83.07	54.2
28.0	25.85	16.1	28.3	29.31	43.9	28.7	57.41	23.5	28.8	84.14	54.2
29.0	25.81	15.8	29.3	28.91	43.9	29.7	57.74	23.6	29.8	85.17	54.1
30.0	25.74	15.5	30.3	28.53	43.9	30.7	58 07	23.6	30.8	86.19	54.1
31.0	25.64	15.2	31.3	28.14	43.9	31.7	58.40	23.6	31.8	87.20	54.0
32.0	25.51	14.9	32.2	27.75	43.9	32.7	58.73	23.7	32.8	88.25	53.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Apr.	h m 1 15	+88° 41′	Apr.	h m 6 45	+87° 13′	Apr.	h m 18 9	+86° 36′	Apr.	h m 19 40	+88° 56′
	s	″		s	″		s	″		s	″
1.0	25.51	14.9	1.2	27.75	43.9	1.7	58.73	23.7	1.8	28.25	53.9
2.0	25.36	14.6	2.2	27.35	43.9	2.7	59.08	23.7	2.8	29.34	53.8
3.0	25.20	14.3	3.2	26.92	43.9	3.7	59.44	23.8	3.8	30.49	53.7
4.0	25.06	14.0	4.2	26.46	43.9	4.7	59.82	23.8	4.8	31.69	53.6
5.0	24.98	13.7	5.2	25.99	43.9	5.7	60.20	23.9	5.8	32.94	53.6
6.0	24.96	13.3	6.2	25.52	43.8	6.7	60.58	24.0	6.8	34.21	53.6
7.0	25.00	13.0	7.2	25.05	43.8	7.7	60.94	24.1	7.8	35.48	53.6
8.0	25.12	12.6	8.2	24.59	43.7	8.7	61.29	24.3	8.8	36.71	53.6
9.0	25.28	12.3	9.2	24.16	43.6	9.7	61.63	24.4	9.8	37.90	53.6
10.0	25.49	12.0	10.2	23.75	43.5	10.7	61.95	24.6	10.8	39.03	53.6
11.0	25.70	11.7	11.2	23.37	43.4	11.7	62.25	24.7	11.8	40.12	53.7
12.0	25.90	11.4	12.2	23.00	43.3	12.7	62.53	24.9	12.8	41.15	53.7
13.0	26.08	11.1	13.2	22.64	43.2	13.7	62.83	25.0	13.8	42.17	53.7
14.0	26.23	10.9	14.2	22.27	43.1	14.7	63.14	25.1	14.8	43.21	53.7
15.0	26.33	10.6	15.2	21.89	43.1	15.7	63.45	25.2	15.8	44.29	53.7
16.0	26.42	10.3	16.2	21.49	43.0	16.7	63.78	25.4	16.8	45.42	53.7
17.0	26.50	10.0	17.2	21.07	42.9	17.7	64.12	25.5	17.8	46.61	53.7
18.0	26.60	9.6	18.2	20.64	42.9	18.7	64.47	25.6	18.8	47.86	53.7
19.0	26.75	9.3	19.2	20.18	42.8	19.7	64.82	25.8	19.8	49.13	53.8
20.0	26.97	9.0	20.2	19.71	42.6	20.7	65.17	26.0	20.8	50.42	53.8
21.0	27.27	8.6	21.2	19.26	42.5	21.7	65.50	26.2	21.7	51.70	53.9
22.0	27.63	8.3	22.2	18.84	42.3	22.7	65.81	26.4	22.7	52.93	54.0
23.0	28.05	8.0	23.2	18.44	42.1	23.7	66.10	26.7	23.7	54.08	54.1
24.0	28.48	7.7	24.2	18.07	42.0	24.7	66.37	26.9	24.7	55.18	54.2
25.0	28.91	7.4	25.2	17.72	41.8	25.7	66.63	27.1	25.7	56.21	54.3
26.0	29.34	7.1	26.2	17.40	41.6	26.7	66.88	27.3	26.7	57.19	54.4
26.9	29.74	6.9	27.2	17.10	41.5	27.7	67.13	27.5	27.7	58.15	54.5
27.9	30.09	6.6	28.2	16.79	41.3	28.7	67.38	27.7	28.7	59.12	54.6
28.9	30.41	6.4	29.2	16.46	41.2	29.6	67.63	27.9	29.7	60.13	54.7
29.9	30.72	6.1	30.2	16.12	41.0	30.6	67.90	28.1	30.7	61.18	54.8
30.9	31.05	5.8	31.2	15.77	40.9	31.6	68.18	28.3	31.7	62.28	54.9
31.9	31.41	5.5									

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
May	h m 1 15	° ′ +88 40	May	h m 6 45	° ′ +87 13	May	h m 18 10	° ′ +86 36	May	h m 19 41	° ′ +88 56
	s	″		s	″		s	″		s	″
1.9	31.41	65.5	1.2	15.77	40.9	1.6	8.18	28.3	1.7	2.28	54.9
2.9	31.81	65.2	2.2	15.40	40.7	2.6	8.46	28.5	2.7	3.41	54.9
3.9	32,28	64.9	3.2	15.02	40.6	3.6	8.74	28.7	3.7	4.56	55.0
4.9	32.82	64.6	4.2	14.64	40.4	4.6	9.01	29.0	4.7	5.72	55.2
5.9	33.43	64.4	5.2	14.28	40.1	5.6	9.26	29.3	5.7	6.84	55.4
6.9	34.07	64.1	6.1	13.93	39.9	6.6	9.49	29.5	6.7	7.90	55.6
7.9	34.72	63.9	7.1	13.62	39.7	7.6	9.71	29.8	7.7	8.90	55.8
8.9	35.38	63.6	8.1	13.34	39.4	8.6	9.91	30.1	8.7	9.83	56.0
9.9	36.02	63.4	9.1	13.09	39.2	9.6	10.09	30.4	9.7	10.71	56.2
10.9	36.60	63.2	10.1	12.85	38.9	10.6	10.27	30.7	10.7	11.55	56.4
11.9	37.14	63.0	11.1	12.61	38.7	11.6	10.45	30.9	11.7	12.38	56.5
12.9	37.66	62.8	12.1	12.37	38.5	12.6	10.63	31.1	12.7	13.22	56.7
13.9	38.15	62.6	13.1	12.11	38.3	13.6	10.83	31.4	13.7	14.11	56.8
14.9	38.65	62.3	14.1	11.83	38.1	14.6	11.04	31.6	14.7	15.05	57.0
15.9	39.21	62.1	15.1	11.53	37.9	15.6	11.26	31.8	15.7	16.05	57.1
16.9	39.80	61.8	16.1	11.23	37.7	16.6	11.48	32.1	16.7	17.08	57.3
17.9	40.47	61.6	17.1	10.92	37.5	17.6	11.69	32.4	17.7	18.11	57.5
18.9	41.21	61.3	18.1	10.61	37.2	18.6	11.89	32.7	18.7	19.13	57.7
19.9	41.99	61.1	19.1	10.32	36.9	19.6	12.08	33.0	19.7	20.10	57.9
20.9	42.81	60.9	20.1	10.06	36.6	20.6	12.25	33.4	20.7	21.02	58.2
21.9	43.63	60.7	21.1	9.83	36.3	21.6	12.39	33.7	21.7	21.85	58.4
22.9	44.44	60.5	22.1	9.64	36.0	22.6	12.50	34.0	22.7	22.60	58.7
23.9	45.21	60.4	23.1	9.46	35.8	23.6	12.60	34.3	23.7	23.28	59.0
24.9	45.95	60.2	24.1	9.31	35.5	24.6	12.69	34.6	24.7	23.94	59.2
25.9	46.64	60.1	25.1	9.16	35.2	25.6	12.78	34.9	25.7	24.60	59.4
26.9	47.30	59.9	26.1	9.01	35.0	26.6	12.89	35.2	26.7	25.26	59.6
27.9	47.96	59.8	27.1	8.85	34.7	27.6	13.01	35.5	27.6	25.95	59.9
28.9	48.64	59.6	28.1	8.67	34.5	28.6	13.12	35.7	28.6	26.69	60.1
29.9	49.36	59.4	29.1	8.48	34.2	29.6	13.25	36.0	29.6	27.47	60.3
30.9	50.14	59.2	30.1	8.29	34.0	30.6	13 37	36.3	30.6	28.25	60.5
31.9	50.99	59.0	31.1	8.09	33.7	31.6	13.49	36.7	31.6	29.03	60.8
32.9	51.89	58.9	32.1	7.91	33.4	32.6	13.59	37.0	32.6	29.79	61.1

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
June	h m 1 15	° ′ +88 40	June	h m 6 45	° ′ +87 13	June	h m 18 10	° ′ +86 36	June	h m 19 41	° ′ +88 57
	s	″		s	″		s	″		s	″
1.9	51.89	58.9	1.1	7.91	33.4	1.6	13.59	37.0	1.6	29.79	1.1
2.8	52.83	58.7	2.1	7.74	33.1	2.6	13.67	37.3	2.6	30.51	1.4
3.8	53.79	58.6	3.1	7.60	32.7	3.6	13.73	37.7	3.6	31.15	1.7
4.8	54.75	58.5	4.1	7.49	32.4	4.6	13.77	38.1	4.6	31.71	2.0
5.8	55.70	58.4	5.1	7.43	32.1	5.5	13.79	38.4	5.6	32.21	2.3
6.8	56.59	58.3	6.1	7.38	31.7	6.5	13.79	38.7	6.6	32.64	2.6
7.8	57.43	58.3	7.1	7.33	31.4	7.5	13.80	39.0	7.6	33.06	2.9
8.8	58.23	58.2	8.1	7.28	31.1	8.5	13.82	39.3	8.6	33.48	3.1
9.8	59.01	58.1	9.1	7.23	30.9	9.5	13.85	39.6	9.6	33.93	3.4
10.8	59.77	58.0	10.1	7.15	30.6	10.5	13.88	39.9	10.6	34.42	3.6
11.8	60.55	57.9	11.1	7.06	30.3	11.5	13.92	40.2	11.6	34.96	3.9
12.8	61.37	57.7	12.1	6.96	30.1	12.5	13.98	40.5	12.6	35.53	4.2
13.8	62.26	57.6	13.0	6.84	29.8	13.5	14.02	40.8	13.6	36.11	4.4
14.8	63.20	57.5	14.0	6.74	29.4	14.5	14.05	41.2	14.6	36.68	4.7
15.8	64.20	57.4	15.0	6.64	29.1	15.5	14.07	41.6	15.6	37.22	5.1
16.8	65.23	57.3	16.0	6.57	28.8	16.5	14.06	41.9	16.6	37.69	5.4
17.8	66.27	57.3	17.0	6.54	28.4	17.5	14.04	42.3	17.6	38.08	5.7
18.8	67.30	57.2	18.0	6.54	28.1	18.5	13.99	42.6	18.6	38.40	6.1
19.8	68.29	57.2	19.0	6.57	27.7	19.5	13.93	43.0	19.6	38.63	6.4
20.8	69.24	57.2	20.0	6.62	27.4	20.5	13.86	43.3	20.6	38.82	6.8
21.8	70.14	57.2	21.0	6.68	27.1	21.5	13.78	43.6	21.6	38.98	7.1
22.8	70.99	57.2	22.0	6.74	26.8	22.5	13.70	43.9	22.6	39.14	7.4
23.8	71.83	57.2	23.0	6.79	26.5	23.5	13.64	44.2	23.6	39.32	7.6
24.8	72.68	57.1	24.0	6.83	26.2	24.5	13.58	44.5	24.6	39.53	7.9
25.8	73.54	57.1	25.0	6.86	25.9	25.5	13.53	44.8	25.6	39.78	8.2
26.8	74.44	57.1	26.0	6.87	25.6	26.5	13.48	45.1	26.6	40.06	8.5
27.8	75.40	57.0	27.0	6.88	25.3	27.5	13.42	45.4	27.6	40.36	8.8
28.8	76.43	57.0	28.0	6.89	25.0	28.5	13.35	45.8	28.6	40.60	9.2
29.8	77.50	57.0	29.0	6.93	24.7	29.5	13.27	46.1	29.6	40.82	9.5
30.8	78.58	57.0	30.0	6.99	24.3	30.5	13.16	46.5	30.6	40.97	9.9
31.8	79.66	57.0	31.0	7.09	24.0	31.5	13.03	46.8	31.6	41.04	10.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	1 16	+88 40	July	6 45	+87 13	July	18 10	+86 36	July	19 41	+88 57
	s	″		s	″		s	″		s	″
1.8	19.66	57.0	1.0	7.09	24.0	1.5	13.03	46.8	1.6	41.04	10.3
2.8	20.73	57.1	2.0	7.22	23.6	2.5	12.89	47.2	2.5	41.05	10.7
3.8	21.75	57.1	3.0	7.37	23.3	3.5	12.73	47.5	3.5	40.98	11.0
4.8	22.72	57.2	4.0	7.53	22.9	4.5	12.57	47.8	4.5	40.86	11.4
5.8	23.63	57.3	5.0	7.70	22.6	5.5	12.41	48.1	5.5	40.75	11.7
6.8	24.48	57.4	6.0	7.86	22.4	6.5	12.25	48.4	6.5	40.65	12.0
7.8	25.33	57.4	7.0	8.00	22.1	7.5	12.10	48.6	7.5	40.59	12.3
8.7	26.18	57.5	8.0	8.13	21.8	8.5	11.97	48.9	8.5	40.56	12.6
9.7	27.06	57.5	9.0	8.24	21.5	9.5	11.85	49.2	9.5	40.59	12.9
10.7	27.99	57.5	10.0	8.34	21.2	10.5	11.73	49.5	10.5	40.65	13.2
11.7	28.96	57.5	11.0	8.44	20.9	11.4	11.60	49.8	11.5	40.69	13.5
12.7	29.98	57.6	12.0	8.55	20.6	12.4	11.46	50.1	12.5	40.69	13.9
13.7	31.03	57.6	13.0	8.67	20.3	13.4	11.29	50.5	13.5	40.66	14.2
14.7	32.10	57.7	14.0	8.83	19.9	14.4	11.11	50.8	14.5	40.54	14.6
15.7	33.16	57.8	15.0	9.02	19.6	15.4	10.90	51.1	15.5	40.34	15.0
16.7	34.19	58.0	16.0	9.25	19.3	16.4	10.67	51.5	16.5	40.06	15.4
17.7	35.17	58.1	17.0	9.50	18.9	17.4	10.44	51.8	17.5	39.71	15.7
18.7	36.09	58.2	18.0	9.77	18.6	18.4	10.19	52.0	18.5	39.34	16.0
19.7	36.97	58.4	19.0	10.05	18.3	19.4	9.94	52.3	19.5	38.95	16.4
20.7	37.80	58.5	19.9	10.31	18.1	20.4	9.71	52.5	20.5	38.58	16.7
21.7	38.62	58.6	20.9	10.55	17.8	21.4	9.49	52.8	21.5	38.25	17.0
22.7	39.45	58.8	21.9	10.77	17.6	22.4	9.28	53.0	22.5	37.95	17.3
23.7	40.31	58.9	22.9	10.99	17.3	23.4	9.07	53.3	23.5	37.67	17.6
24.7	41.22	59.0	23.9	11.20	17.0	24.4	8.86	53.5	24.5	37.41	17.9
25.7	42.20	59.1	24.9	11.41	16.7	25.4	8.64	53.8	25.5	37.14	18.2
26.7	43.21	59.2	25.9	11.64	16.4	26.4	8.40	54.1	26.5	36.84	18.6
27.7	44.23	59.4	26.9	11.89	16.1	27.4	8.15	54.4	27.5	36.48	18.9
28.7	45.25	59.6	27.9	12.17	15.8	28.4	7.87	54.7	28.5	36.05	19.3
29.7	46.27	59.7	28.9	12.47	15.5	29.4	7.58	55.0	29.5	35.54	19.7
30.7	47.25	59.9	29.9	12.80	15.2	30.4	7 27	55.3	30.5	34.95	20.0
31.7	48.16	60.1	30.9	13.15	14.9	31.4	6.96	55.5	31.5	34.33	20.4
32.7	49.01	60.4	31.9	13.51	14.6	32.4	6.65	55.8	32.5	33.69	20.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Aug.	h m 1 16	° ′ +88 41	Aug.	h m 6 45	° ′ +87 13	Aug.	h m 18 9	° ′ +86 36	Aug.	h m 19 41	° ′ +88 57
	s	″		s	″		s	″		s	″
1.7	49.01	0.4	1.9	13.86	14.3	1.4	66.65	55.8	1.5	33.69	20.7
2.7	49.81	0.6	2.9	14.20	14.1	2.4	66.35	56.0	2.5	33.05	21.0
3.7	50.57	0.8	3.9	14.52	13.9	3.4	66.05	56.2	3.5	32.45	21.3
4.7	51.32	1.0	4.9	14.82	13.7	4.4	65.76	56.4	4.5	31.88	21.6
5.7	52.09	1.1	5.9	15.11	13.4	5.4	65.49	56.6	5.5	31.36	21.9
6.7	52.89	1.3	6.9	15.39	13.2	6.4	65.23	56.8	6.5	30.88	22.2
7.7	53.74	1.5	7.9	15.67	12.9	7.4	64.97	57.0	7.5	30.40	22.5
8.7	54.63	1.6	8.9	15.96	12.6	8.4	64.69	57.3	8.4	29.91	22.8
9.7	55.55	1.8	9.9	16.28	12.4	9.4	64.40	57.5	9.4	29.38	23.1
10.7	56.49	2.0	10.9	16.63	12.1	10.4	64.08	57.8	10.4	28.70	23.4
11.7	57.43	2.3	11.9	17.02	11.8	11.4	63.75	58.0	11.4	28.11	23.8
12.7	58.35	2.5	12.9	17.43	11.5	12.4	63.39	58.3	12.4	27.36	24.1
13.7	59.21	2.8	13.9	17.87	11.3	13.4	63.02	58.5	13.4	26.54	24.4
14.6	60.01	3.1	14.9	18.30	11.1	14.4	62.66	58.7	14.4	25.68	24.7
15.6	60.75	3.3	15.9	18.72	10.9	15.4	62.29	58.9	15.4	24.79	25.0
16.6	61.45	3.6	16.9	19.13	10.7	16.4	61.92	59.0	16.4	23.92	25.3
17.6	62.11	3.9	17.9	19.53	10.5	17.3	61.57	59.2	17.4	23.07	25.6
18.6	62.77	4.1	18.9	19.91	10.3	18.3	61.23	59.3	18.4	22.26	25.8
19.6	63.45	4.3	19.9	20.28	10.1	19.3	60.90	59.5	19.4	21.50	26.1
20.6	64.18	4.6	20.9	20.65	9.9	20.3	60.57	59.6	20.4	20.75	26.3
21.6	64.94	4.8	21.9	21.02	9.6	21.3	60.24	59.8	21.4	19.99	26.6
22.6	65.75	5.0	22.8	21.40	9.4	22.3	59.90	60.0	22.4	19.24	26.9
23.6	66.58	5.3	23.8	21.81	9.2	23.3	59.54	60.2	23.4	18.43	27.2
24.6	67.42	5.6	24.8	22.25	8.9	24.3	59.16	60.4	24.4	17.56	27.5
25.6	68.25	5.9	25.8	22.72	8.7	25.3	58.77	60.6	25.4	16.61	27.8
26.6	69.05	6.2	26.8	23.22	8.5	26.3	58.36	60.8	26.4	15.60	28.1
27.6	69.79	6.5	27.8	23.71	8.3	27.3	57.94	60.9	27.4	14.53	28.4
28.6	70.45	6.9	28.8	24.20	8.1	28.3	57.52	61.1	28.4	13.43	28.7
29.6	71.05	7.2	29.8	24.69	7.9	29.3	57.11	61.2	29.4	12.34	29.0
30.6	71.61	7.5	30.8	25.15	7.8	30.3	56.71	61.3	30.4	11.27	29.2
31.6	72.15	7.8	31.8	25.60	7.7	31.3	56.33	61.4	31.4	10.24	29.4
32.6	72.67	8.1	32.8	26.02	7.5	32.3	55.96	61.5	32.4	9.26	29.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Sept.	h m 1 17	° ′ +88 41	Sept.	h m 6 45	° ′ +87 13	Sept.	h m 18 9	° ′ +86 37	Sept.	h m 19 40	° ′ +88 57
	s	″		s	″		s	″		s	″
1.6	12.67	8.1	1.8	26.02	7.5	1.3	55.96	1.5	1.4	69.26	29.6
2.6	13.21	8.4	2.8	26.43	7.4	2.3	55.60	1.6	2.4	68.34	29.8
3.6	13.80	8.6	3.8	26.82	7.2	3.3	55.25	1.7	3.4	67.44	30.0
4.6	14.43	8.9	4.8	27.23	7.0	4.3	54.89	1.8	4.4	66.54	30.3
5.6	15.10	9.2	5.8	27.67	6.8	5.3	54.51	1.9	5.4	65.60	30.5
6.6	15.78	9.5	6.8	28.13	6.5	6.3	54.12	2.1	6.4	64.62	30.8
7.6	16.46	9.8	7.8	28.61	6.4	7.3	53.71	2.2	7.4	63.57	31.1
8.6	17.14	10.1	8.8	29.13	6.3	8.3	53.29	2.4	8.4	62.45	31.3
9.6	17.77	10.5	9.8	29.66	6.2	9.3	52.85	2.5	9.4	61.24	31.6
10.6	18.32	10.8	10.8	30.21	6.0	10.3	52.41	2.5	10.4	59.99	31.8
11.6	18.81	11.2	11.8	30.75	5.9	11.3	51.97	2.6	11.4	58.73	32.0
12.6	19.25	11.6	12.8	31.27	5.8	12.3	51.53	2.7	12.4	57.47	32.2
13.6	19.64	11.9	13.8	31.78	5.7	13.3	51.10	2.7	13.4	56.24	32.4
14.6	20.01	12.3	14.8	32.26	5.6	14.3	50.69	2.7	14.3	55.05	32.6
15.6	20.40	12.6	15.8	32.73	5.6	15.3	50.29	2.7	15.3	53.91	32.7
16.6	20.81	12.9	16.8	33.19	5.5	16.3	49.90	2.8	16.3	52.79	32.9
17.6	21.27	13.1	17.8	33.65	5.3	17.3	49.50	2.8	17.3	51.70	33.1
18.6	21.76	13.5	18.8	34.13	5.2	18.3	49.10	2.9	18.3	50.60	33.3
19.6	22.29	13.9	19.8	34.62	5.1	19.3	48.69	3.0	19.3	49.47	33.5
20.5	22.82	14.2	20.8	35.13	5.0	20.3	48.28	3.1	20.3	48.28	33.7
21.5	23.35	14.6	21.8	35.67	4.9	21.3	47.84	3.1	21.3	47.04	33.9
22.5	23.85	15.0	22.8	36.24	4.7	22.3	47.39	3.2	22.3	45.73	34.1
23.5	24.31	15.4	23.8	36.81	4.6	23.2	46.93	3.2	23.3	44.37	34.3
24.5	24.68	15.8	24.8	37.38	4.6	24.2	46.47	3.2	24.3	42.97	34.5
25.5	24.98	16.2	25.8	37.95	4.5	25.2	46.01	3.2	25.3	41.57	34.6
26.5	25.23	16.5	26.8	38.49	4.5	26.2	45.57	3.2	26.3	40.19	34.8
27.5	25.44	16.9	27.7	39.01	4.5	27.2	45.15	3.1	27.3	38.86	34.9
28.5	25.63	17.2	28.7	39.50	4.5	28.2	44.75	3.1	28.3	37.59	35.0
29.5	25.83	17.6	29.7	39.97	4.4	29.2	44.34	3.1	29.3	36.36	35.1
30.5	26.06	17.9	30.7	40.42	4.4	30.2	43.96	3.0	30.3	35.18	35.2
31.5	26.33	18.3	31.7	40.89	4.4	31.2	43.57	3.0	31.3	34.01	35.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Oct.	h m 1 17	° ′ +88 41	Oct.	h m 6 45	° ′ +87 13	Oct.	h m 18 9	° ′ +86 37	Oct.	h m 19 39	° ′ +88 57
	s	″		s	″		s	″		s	″
1.5	26.33	18.3	1.7	40.89	4.4	1.2	43.57	3.0	1.3	94.01	35.3
2.5	26.64	18.6	2.7	41.37	4.3	2.2	43.18	3.0	2.3	92.85	35.4
3.5	26.98	18.9	3.7	41.87	4.2	3.2	42.79	3.0	3.3	91.65	35.6
4.5	27.33	19.3	4.7	42.39	4.2	4.2	42.37	3.0	4.3	90.38	35.7
5.5	27.64	19.7	5.7	42.94	4.1	5.2	41.93	3.0	5.3	89.05	35.9
6.5	27.93	20.1	6.7	43.51	4.1	6.2	41.48	3.0	6.3	87.65	36.0
7.5	28.16	20.5	7.7	44.10	4.1	7.2	41.03	3.0	7.3	86.20	36.1
8.5	28.33	20.9	8.7	44.68	4.1	8.2	40.57	2.9	8.3	84.73	36.2
9.5	28.43	21.3	9.7	45.24	4.1	9.2	40.13	2.8	9.3	83.26	36.3
10.5	28.47	21.7	10.7	45.78	4.1	10.2	39.70	2.7	10.3	81.82	36.4
11.5	28.48	22.1	11.7	46.31	4.2	11.2	39.29	2.6	11.3	80.42	36.4
12.5	28.50	22.4	12.7	46.81	4.2	12.2	38.89	2.5	12.3	79.07	36.5
13.5	28.52	22.8	13.7	47.30	4.3	13.2	38.50	2.4	13.3	77.77	36.5
14.5	28.58	23.1	14.7	47.78	4.3	14.2	38.12	2.3	14.3	76.50	36.5
15.5	28.69	23.5	15.7	48.27	4.3	15.2	37.73	2.2	15.3	75.24	36.6
16.5	28.83	23.8	16.7	48.76	4.3	16.2	37.35	2.2	16.3	73.98	36.7
17.5	28.99	24.2	17.7	49.27	4.3	17.2	36.94	2.1	17.3	72.68	36.8
18.5	29.14	24.6	18.7	49.81	4.3	18.2	36.52	2.1	18.2	71.32	36.8
19.5	29.28	25.0	19.7	50.37	4.3	19.2	36.10	2.0	19.2	69.90	36.9
20.5	29.36	25.4	20.7	50.95	4.3	20.2	35.66	1.9	20.2	68.44	37.0
21.5	29.38	25.8	21.7	51.52	4.4	21.2	35.22	1.8	21.2	66.93	37.0
22.5	29.32	26.2	22.7	52.08	4.5	22.2	34.79	1.6	22.2	65.42	37.1
23.5	29.20	26.6	23.7	52.62	4.6	23.2	34.39	1.5	23.2	63.93	37.1
24.5	29.03	27.0	24.7	53.13	4.7	24.2	33.99	1.3	24.2	62.48	37.1
25.5	28.84	27.3	25.7	53.62	4.8	25.2	33.61	1.1	25.2	61.10	37.0
26.4	28.64	27.7	26.7	54.08	4.9	26.2	33.24	0.9	26.2	59.78	37.0
27.4	28.46	28.0	27.7	54.52	5.0	27.2	32.90	0.8	27.2	58.52	37.0
28.4	28.31	28.4	28.7	54.97	5.1	28.2	32.56	0.6	28.2	57.30	36.9
29.4	28.22	28.7	29.7	55.41	5.2	29.2	32.22	0.5	29.2	56.09	36.9
30.4	28.15	29.0	30.7	55.86	5.3	30.1	31.88	0.4	30.2	54.86	36.9
31.4	28.08	29.4	31.7	56.34	5.3	31.1	31.52	0.2	31.2	53.59	36.9
32.4	28.01	29.7	32.7	56.84	5.4	32.1	31.15	0.1	32.2	52.27	36.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Nov.	h m 1 17	° ′ +88 41	Nov.	h m 6 45	° ′ +87 13	Nov.	h m 18 9	° ′ +86 36	Nov.	h m 19 39	° ′ +88 57
	s	″		s	″		s	″		s	″
1.4	28.01	29.7	1.7	56.84	5.4	1.1	31.15	60.1	1.2	52.27	36.9
2.4	27.92	30.1	2.7	57.37	5.5	2.1	30.76	59.9	2.2	50.88	36.9
3.4	27.77	30.5	3.7	57.90	5.6	3.1	30.37	59.8	3.2	49.45	36.9
4.4	27.55	30.9	4.7	58.44	5.7	4.1	29.98	59.6	4.2	47.98	36.9
5.4	27.27	31.3	5.7	58.96	5.9	5.1	29.60	59.4	5.2	46.52	36.8
6.4	26.93	31.6	6.6	59.46	6.1	6.1	29.22	59.1	6.2	45.09	36.8
7.4	26.54	32.0	7.6	59.94	6.2	7.1	28.87	58.9	7.2	43.69	36.7
8.4	26.14	32.4	8.6	60.39	6.4	8.1	28.54	58.7	8.2	42.36	36.6
9.4	25.75	32.7	9.6	60.82	6.6	9.1	28.22	58.4	9.2	41.10	36.5
10.4	25.38	33.0	10.6	61.23	6.7	10.1	27.92	58.2	10.2	39.89	36.4
11.4	25.06	33.3	11.6	61.64	6.9	11.1	27.63	58.0	11.2	38.71	36.3
12.4	24.77	33.6	12.6	62.06	7.0	12.1	27.34	57.8	12.2	37.54	36.2
13.4	24.52	33.9	13.6	62.50	7.2	13.1	27.03	57.6	13.2	36.34	36.1
14.4	24.26	34.3	14.6	62.95	7.3	14.1	26.71	57.4	14.2	35.09	36.1
15.4	23.99	34.6	15.6	63.42	7.4	15.1	26.38	57.2	15.2	33.80	36.0
16.4	23.69	35.0	16.6	63.91	7.6	16.1	26.05	57.0	16.2	32.47	35.9
17.4	23.33	35.3	17.6	64.39	7.8	17.1	25.72	56.8	17.2	31.10	35.8
18.4	22.90	35.7	18.6	64.87	8.0	18.1	25.39	56.5	18.2	29.72	35.7
19.4	22.40	36.1	19.6	65.33	8.2	19.1	25.07	56.2	19.2	28.37	35.6
20.4	21.83	36.4	20.6	65.75	8.4	20.1	24.77	56.0	20.2	27.06	35.4
21.4	21.23	36.7	21.6	66.14	8.6	21.1	24.49	55.7	21.2	25.81	35.3
22.4	20.62	37.0	22.6	66.50	8.9	22.1	24.24	55.4	22.2	24.64	35.1
23.4	20.02	37.3	23.6	66.85	9.1	23.1	24.01	55.1	23.2	23.54	34.9
24.4	19.47	37.5	24.6	67.19	9.3	24.1	23.79	54.8	24.2	22.49	34.7
25.4	18.95	37.8	25.6	67.52	9.5	25.1	23.57	54.6	25.2	21.48	34.6
26.4	18.47	38.1	26.6	67.85	9.7	26.1	23.35	54.3	26.2	20.47	34.4
27.4	18.00	38.3	27.6	68.20	9.9	27.1	23.12	54.1	27.1	19.44	34.3
28.4	17.54	38.6	28.6	68.56	10.1	28.1	22.88	53.8	28.1	18.36	34.2
29.4	17.06	38.9	29.6	68.95	10.3	29.1	22.63	53.6	29.1	17.24	34.0
30.4	16.55	39.2	30.6	69.35	10.5	30.1	22.37	53.3	30.1	16.08	33.9
31.4	15.98	39.5	31.6	69.75	10.8	31.1	22.12	53.0	31.1	14.88	33.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	1 16	+88 41	Dec.	6 46	+87 13	Dec.	18 9	+86 36	Dec.	19 38	+88 57
	s	″		s	″		s	″		s	″
1.3	75.98	39.5	1.6	9.75	10.8	1.1	22.12	53.0	1.1	74.88	33.7
2.3	75.33	39.8	2.6	10.14	11.0	2.1	21.88	52.7	2.1	73.68	33.5
3.3	74.62	40.1	3.6	10.51	11.3	3.1	21.65	52.4	3.1	72.51	33.3
4.3	73.86	40.4	4.6	10.85	11.6	4.1	21.43	52.0	4.1	71.39	33.1
5.3	73.08	40.7	5.6	11.16	11.9	5.0	21.24	51.7	5.1	70.33	32.8
6.3	72.31	40.9	6.6	11.44	12.2	6.0	21.07	51.4	6.1	69.34	32.6
7.3	71.56	41.1	7.6	11.70	12.5	7.0	20.91	51.0	7.1	68.43	32.3
8.3	70.84	41.3	8.6	11.96	12.7	8.0	20.76	50.7	8.1	67.55	32.1
9.3	70.17	41.5	9.6	12.21	13.0	9.0	20.62	50.4	9.1	66.70	31.9
10.3	69.55	41.7	10 6	12.46	13.2	10.0	20.47	50.2	10.1	65.86	31.7
11.3	68.94	42.0	11.5	12.74	13.5	11.0	20.31	49.9	11.1	64.99	31.5
12.3	68.32	42.2	12.5	13.04	13.7	12.0	20.15	49.6	12.1	64.09	31.3
13.3	67.68	42.5	13.5	13.34	14.0	13.0	19.98	49.3	13.1	63.14	31.1
14.3	66.99	42.7	14.5	13.65	14.2	14.0	19.81	49.0	14.1	62.16	30.9
15.3	66.25	42.9	15.5	13.95	14.5	15.0	19.64	48.7	15.1	61.18	30.6
16.3	65.43	43.2	16.5	14.24	14.8	16.0	19.48	48.3	16.1	60.20	30.4
17.3	64.55	43.4	17.5	14.49	15.2	17.0	19.34	48.0	17.1	59.27	30.1
18.3	63.63	43.6	18.5	14.71	15.5	18.0	19.23	47.6	18.1	58.41	29.8
19.3	62.70	43.8	19.5	14.90	15.8	19.0	19.14	47.2	19.1	57.63	29.5
20.3	61.78	43.9	20.5	15.05	16.2	20.0	19.07	46.9	20.1	56.94	29.2
21.3	60.89	44.1	21.5	15.19	16.5	21.0	19.02	46.5	21.1	56.33	28.9
22.3	60.05	44.2	22.5	15.32	16.8	22.0	18.98	46.2	22.1	55.76	28.6
23.3	59.26	44.3	23.5	15.44	17.0	23.0	18.94	45.9	23.1	55.21	28.4
24.3	58.49	44.4	24.5	15.58	17.3	24.0	18.90	45.6	24.1	54.66	28.1
25.3	57.73	44.6	25.5	15.73	17.6	25.0	18.85	45.3	25.1	54.08	27.9
26.3	56.98	44.7	26.5	15.91	17.9	26.0	18.79	45.0	26.1	53.46	27.6
27.3	56.21	44.9	27.5	16.10	18.1	27.0	18.72	44.7	27.1	52.80	27.4
28.3	55.38	45.0	28.5	16.29	18.5	28.0	18.65	44.4	28.1	52.11	27.1
29.3	54.49	45.2	29.5	16.47	18.8	29.0	18.59	44.1	29.1	51.41	26.8
30.3	53.54	45.3	30.5	16.63	19.1	30.0	18.54	43.7	30.1	50.74	26.5
31.3	52.55	45.5	31.5	16.75	19.5	31.0	18.51	43.3	31.1	50.11	26.2
32.3	51.53	45.6	32.5	16.85	19.8	32.0	18.49	42.9	32.1	49.55	25.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Andromedæ.		γ Pegasi. (*Algenib.*)		*β* Hydri.		12 Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 0 2	+28° 26′	h m 0 7	+14° 31′	h m 0 19	−77° 54′	h m 0 24	− 4° 35′
	s	″	s	″	s	″	s	″
(Dec. 30.2)	21.33 −.14	53.6 −0.8	13.48 −.12	67.8 −0.8	33.09 −.96	63.3 +0.7	4.78 −.12	72.4 −0.7
Jan. 9.2	21.18 .14	52.6 1.1	13.35 .12	66.9 0.9	32.15 .91	62.3 1.3	4.66 .12	73.1 0.6
19.2	21.05 .13	51.4 1.3	13.24 .11	65.9 1.0	31.28 .83	60.7 1.8	4.55 .11	73.6 0.5
29.2	20.92 .12	50.0 1.5	13.13 .10	64.9 1.1	30.49 .74	58.6 2.4	4.44 .10	74.1 0.4
Feb. 8.1	20.82 .09	48.4 1.6	13.04 .08	63.8 1.1	29.80 .63	56.0 2.8	4.35 .09	74.4 −0.2
18.1	20 74 −.07	46.7 −1.7	12 97 −.06	62.7 −1.0	29.23 −.50	53.0 +3.2	4.27 −.07	74.6 0.0
28.1	20.69 −.03	45.0 1.6	12.93 −.03	61.8 0.9	28.80 .36	49.7 3.4	4.21 .04	74.5 +0.2
Mar. 10.0	20.67 +.01	43.4 1.5	12.92 +.01	60.9 0.8	28.51 .21	46.1 3.6	4.19 −.01	74.3 0.4
20.0	20.70 .05	42.0 1.3	12.94 .04	60.2 0.6	28.38 −.06	42.4 3.8	4.19 +.02	73.8 0.6
30.0	20.77 .09	40.8 1.1	13.00 .08	59.8 −0.3	28.40 +.10	38.6 3.8	4.24 .06	73.1 0.9
Apr. 9.0	20.89 +.14	39.8 −0.8	13.11 +.12	50.6 0.0	28.58 +.26	34.8 +3.7	4.32 +.10	72.1 +1.1
18.9	21.05 .19	39.2 0.5	13.25 .17	59.7 +0.3	28.92 .41	31.1 3.6	4.44 .14	70.9 1.3
28.9	21.26 .23	38.9 −0.1	13.44 .20	60.2 0.6	29.41 .56	27.6 3.4	4.60 .18	69.5 1.5
May 8.9	21.51 .26	39.0 +0.3	13.66 .24	60.9 0.9	30.04 .70	24.3 3.1	4.81 .22	67.9 1.7
18.9	21.79 .29	39.5 0.7	13.92 .27	62.0 1.2	30.80 .82	21.4 2.8	5.04 .25	66.1 1.9
28 8	22.10 +.32	40.4 +1.1	14.20 +.29	63.3 +1 5	31.67 +.92	18.8 +2.4	5.30 +.27	64.2 +2.0
June 7.8	22.43 .33	41.6 1.4	14.51 .31	64.9 1.7	32.64 1.00	16.7 1.9	5.59 .29	62.2 2.0
17.8	22.76 .34	43.2 1.7	14.82 .31	66.7 1.9	33.67 1.05	15.0 1.4	5.89 .30	60.2 2.0
27.7	23.10 .34	45.1 2.0	15.13 .31	68.6 2.0	34.75 1.08	13.9 0.8	6.20 .31	58.1 2.0
July 7.7	23.43 .32	47.2 2.2	15.44 .30	70.7 2.1	35.84 1.08	13.4 +0.3	6.50 .30	56.2 1.9
17.7	23.74 +.30	49.5 +2.3	15.74 +.29	72.8 +2.1	36.91+1.05	13.4 −0.3	6.80 +.29	54.4 +1.7
27.7	24.04 .28	51.9 2.4	16.02 .26	74.9 2.1	37.93 .99	14.0 0.9	7.08 .27	52.8 1.5
Aug. 6 .6	24.30 .24	54.3 2.5	16.26 .23	77.0 2.0	38.88 .89	15.2 1.4	7.33 .24	51.4 1.3
16.6	24.52 .20	56.8 2.4	16.48 .20	79.0 1.9	39.71 .77	16.8 1.9	7.56 .21	50.2 1.0
26.6	24.70 .16	59.2 2.4	16.66 .16	80.8 1.7	40.41 .62	19.0 2.3	7.75 .17	49.3 0.8
Sept. 5.6	24.85 +.12	61.5 +2 3	16.80 +.12	82.4 +1.6	40.96 +.46	21.5 −2.7	7.91 +.14	48.6 +0.5
15.5	24.95 .08	63.7 2.1	16.90 .08	83.9 1 4	41.32 .27	24.4 2.9	8.02 .10	48.3 +0.2
25.5	25.01 .04	65.7 1.9	16.97 .05	85.1 1.1	41.50 +.09	27.4 3.1	8.10 .06	48.2 0.0
Oct. 5.5	25.04 +.01	67.5 1.7	17.00 +.01	86.1 0 9	41.49 −.10	30.5 3.1	8.15 +.03	48.4 −0.3
15.4	25.03 −.03	69.1 1 4	17.00 −.02	86.9 0.7	41.29 .29	33.6 3.0	8.16 .00	48.7 0.5
25.4	24.98 −.06	70.4 +1.2	16.97 −.04	87.5 +0.5	40.91 −.46	36.6 −2.8	8.14 −.03	49.2 −0.6
Nov. 4.4	24.91 .08	71.5 0.9	16.91 .07	87.8 +0.2	40.36 .62	39.2 2.5	8.10 .05	49.9 0.7
14.4	24.82 .10	72.2 0.6	16.83 .09	88.0 0.0	39.68 .75	41.5 2.0	8.04 .07	50.7 0.8
24.3	24.71 .12	72.7 +0.3	16.74 .10	87.9 −0.2	38.87 .85	43.3 1.5	7.95 .09	51.5 0.8
Dec. 4.3	24.58 −.13	72.8 0.0	16.63 −.11	87.6 −0.4	37.98 −.92	44.6 −1.0	7.85 −.10	52.4 −0.8
14.3	24.44 .14	72.6 −0.3	16.51 .12	87.1 0.6	37.04 .95	45.2 −0.4	7.74 .11	53.2 0.8
24.3	24.30 .15	72.1 0.7	16.39 .12	86.4 0.7	36.08 .96	45.3 +0.3	7.63 .12	54.0 0.8
34.2	24.15 −.14	71.3 −1.0	16.26 −.12	85.6 −0.9	35.13 − 93	44.7 +0.9	7.51 −.12	54.7 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cassiopeæ.		β Ceti.		21 Cassiopeæ.		ε Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 0 33	° ′ +55 53	h m 0 37	° ′ −18 37	h m 0 37	° ′ +74 20	h m 0 56	° ′ + 7 15
	s	″	s	″	s	″	s	″
(Dec. 30.3)	53.99 −.28	63.9 −0.2	43.66 −.13	48.4 −0.7	58.94 −.68	77.2 +0.3	53.30 −.12	40.4 −0.7
Jan. 9.2	53.70 .29	63.5 0.7	43.53 .13	48.9 0.4	58.24 .70	77.2 −0.3	53.17 .12	39.7 0.8
19.2	53.42 .28	62.5 1.2	43.40 .13	49.2 −0.2	57.54 .68	76.5 1.0	53.05 .12	38.9 0.7
29.2	53.15 .26	61.1 1.6	43.28 .12	49.2 +0.1	56.88 .64	75.2 1.5	52.93 .12	38.2 0.7
Feb. 8.1	52.90 .23	59.2 2.0	43.16 .10	49.0 0.4	56.27 .57	73.5 2.0	52.81 .11	37.5 0.7
18.1	52.69 −.19	57.1 −2.3	43.07 −.08	48.5 +0.6	55.74 −.47	71.2 −2.4	52.71 −.09	36.8 −0.6
28.1	52.53 .13	54.7 2.5	43.00 .06	47.7 0.9	55.33 .35	68.6 2.7	52.62 .07	36.3 0.5
Mar. 10.1	52.43 −.07	52.1 2.6	42.95 −.03	46.6 1.2	55.04 .22	65.8 2.9	52.57 .04	35.9 0.3
20.0	52.39 .00	49.5 2.6	42.94 +.01	45.4 1.4	54.89 −.07	62.7 3.0	52.54 −.01	35.6 −0.1
30.0	52.42 +.07	47.0 2.4	42.97 .05	43.8 1.6	54.90 +.08	59.7 3.0	52.55 +.03	35.6 +0.1
Apr. 9.0	52.53 +.15	44.6 −2.2	43.03 +.09	42.0 +1.9	55.06 +.24	56.8 −2.8	52.60 +.07	35.8 +0.3
19.0	52.71 .22	42.5 1.9	43.14 .13	40.1 2.0	55.37 .39	54.0 2.6	52.70 .12	36.3 0.6
28.9	52.97 .29	40.8 1.5	43.29 .17	38.0 2.2	55.83 .52	51.6 2.2	52.84 .16	37.0 0.9
May 8.9	53.29 .35	39.5 1.1	43.48 .21	35.7 2.3	56.41 .64	49.6 1.8	53.01 .20	38.0 1.1
18.9	53.66 .40	38.6 0.6	43.71 .24	33.4 2.3	57.10 .74	48.1 1.3	53.23 .23	39.2 1.3
28.8	54.08 +.44	38.2 −0.1	43.97 +.27	31.1 +2.3	57.88 +.81	47.0 −0.8	53.48 +.26	40.7 +1.5
June 7.8	54.53 .46	38.4 +0.4	44.26 .30	28.8 2.3	58.72 .86	46.5 −0.2	53.76 .29	42.3 1.7
17.8	55.01 .48	39.0 0.9	44.56 .31	26.6 2.1	59.60 .89	46.6 +0.3	54.05 .30	44.1 1.8
27.8	55.49 .48	40.1 1.3	44.88 .32	24.5 1.9	60.50 .89	47.2 0.9	54.36 .31	46.0 1.9
July 7.7	55.97 .47	41.6 1.7	45.19 .31	22.7 1.7	61.39 .88	48.3 1.4	54.67 .31	47.9 1.9
17.7	56.43 +.45	43.5 +2.1	45.50 +.30	21.1 +1.4	62.25 +.84	50.0 +1.9	54.97 +.30	49.8 +1.9
27.7	56.86 .42	45.8 2.5	45.80 .28	19.8 1.1	63.06 .78	52.0 2.3	55.26 .28	51.7 1.8
Aug. 6.7	57.26 .37	48.4 2.7	46.07 .26	18.9 0.8	63.80 .70	54.5 2.7	55.53 .26	53.4 1.7
16.6	57.61 .33	51.3 2.9	46.31 .23	18.2 0.4	64.46 .62	57.4 3.1	55.78 .23	55.0 1.5
26.6	57.91 .27	54.3 3.1	46.52 .19	18.0 +0.1	65.03 .52	60.5 3.3	56.00 .20	56.5 1.3
Sept. 5.6	58.15 +.22	57.4 +3.2	46.70 +.15	18.1 −0.3	65.50 +.41	63.9 +3.4	56.18 +.17	57.7 +1.1
15.5	58.34 .16	60.6 3.2	46.83 .12	18.5 0.6	65.86 .30	67.4 3.6	56.33 .13	58.7 0.9
25.5	58.48 .11	63.8 3.1	46.93 .08	19.3 0.9	66.10 .18	71.0 3.6	56.45 .10	59.5 0.7
Oct. 5.5	58.55 +.05	66.9 3.0	46.99 +.04	20.2 1.1	66.22 +.06	74.6 3.6	56.53 .06	60.0 0.4
15.5	58.57 −.01	69.9 2.9	47.01 .00	21.4 1.3	66.22 −.05	78.2 3.5	56.58 +.03	60.4 +0.2
25.4	58.54 −.06	72.6 +2.6	47.00 −.03	22.8 −1.4	66.11 −.17	81.6 +3.3	56.60 .00	60.5 0.0
Nov. 4.4	58.45 .11	75.1 2.3	46.95 .06	24.2 1.4	65.88 .28	84.8 3.0	56.58 −.02	60.4 −0.1
14.4	58.32 .15	77.3 2.0	46.88 .08	25.6 1.4	65.55 .39	87.6 2.7	56.55 .05	60.2 0.3
24.3	58.15 .19	79.0 1.6	46.80 .10	26.9 1.3	65.12 .48	90.1 2.2	56.49 .07	59.8 0.4
Dec. 4.3	57.94 −.23	80.4 +1.1	46.69 −.11	28.2 −1.2	64.59 −.56	92.1 +1.8	56.41 −.09	59.3 −0.5
14.3	57.69 .26	81.3 0.6	46.57 .12	29.3 1.0	63.99 .63	93.6 1.2	56.32 .10	58.8 0.6
24.3	57.42 .28	81.6 +0.1	46.44 .13	30.2 0.8	63.33 .68	94.6 +0.6	56.21 .11	58.1 0.7
34.2	57.14 −.29	81.5 −0.4	46.31 −.14	30.9 −0.6	62.63 −.71	94.9 0.0	56.09 −.12	57.4 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.		θ¹ Ceti.		38 Cassiopeæ.		η Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 3	+34° 59′	h m 1 18	− 8° 46′	h m 1 22	+69° 39′	h m 1 25	+14° 44′
	s	″	s	″	s	″	s	″
(Dec. 30.3)	12.42 −.15	73.3 −0.3	11.50 −.12	76.4 −0.9	35.42 −.47	63.3 +0.7	14.68 −.11	38.4 −0.5
Jan. 9.3	12.26 .17	72.9 0.6	11.38 .13	77.2 0.7	34.92 .51	63.8 +0.1	14.56 .13	37.8 0.7
19.2	12.09 .17	72.1 1.0	11.25 .13	77.8 0.5	34.40 .52	63.6 −0.4	14.42 .13	37.0 0.8
29.2	11.92 .17	71.0 1.2	11.12 .13	78.3 0.4	33.87 .51	62.9 1.0	14.29 .14	36.3 0.8
Feb. 8.2	11.76 .15	69.6 1 4	10.99 .12	78.5 −0.1	33.37 .48	61.6 1.5	14.15 .13	35.4 0.9
18.1	11.61 −.14	68.1 −1.6	10.87 −.11	78.6 +0.1	32.91 −.43	59.8 −2.0	14.03 −.12	34.6 −0.8
28.1	11.50 .10	66.4 1.7	10.77 .09	78.4 0.3	32.51 .36	57.6 2.4	13.92 .10	33.7 0.8
Mar. 10.1	11.41 .07	64.7 1.7	10.69 .07	77.9 0.5	32.20 .26	55.1 2.6	13.84 .07	33.0 0.7
20.1	11.37 −.02	63.0 1.7	10.64 −.03	77.3 0.8	31.99 .16	52.4 2.8	13.78 −.04	32.4 0.6
30.0	11.37 +.03	61.4 1.5	10.63 +.01	76.4 1.0	31.89 −.04	49.6 2.9	13.77 .00	31.9 0.4
Apr. 9.0	11.42 +.08	60.0 −1.3	10.66 +.05	75.2 +1.3	31.90 +.08	46.7 −2.8	13.79 +.05	31.6 −0.1
19.0	11.53 .13	58.8 1.0	10.72 .09	73.8 1.5	32.04 .20	44.0 2.6	13.86 .09	31.6 +0.1
29.0	11.69 .18	58.0 0.7	10.84 .13	72.2 1.7	32.30 .32	41.5 2.4	13.98 .14	31.8 0.4
May 8.9	11.90 .23	57.4 −0.4	10.99 .17	70.5 1.9	32.67 .42	39.3 2.0	14.13 .18	32.3 0.6
18.9	12.15 .27	57.3 0.0	11.18 .21	68.5 2.0	33.15 .52	37.4 1.6	14.34 .22	33.1 0.9
28.9	12.44 +.31	57.5 +0.4	11.41 +.24	66.5 +2.1	33.70 +.60	36.1 −1.1	14.57 +.25	34.1 +1.1
June 7.8	12.76 .33	58.0 0.8	11.67 .27	64.4 2.1	34.33 .66	35.2 0.6	14 84 .28	35.4 1.4
17.8	13.11 .35	59.0 1.1	11.95 .29	62.3 2.1	35.02 .70	34.8 −0.2	15.13 .30	36.8 1.5
27.8	13.46 .36	60.3 1.4	12.25 .30	60.2 2.0	35.73 .72	34.9 +0.4	15.44 .31	38.4 1.7
July 7.8	13.82 .36	61.9 1.7	12.55 .30	58.2 1.9	36.46 .73	35.5 0.9	15.76 .32	40.2 1.8
17.7	14.18 +.35	63.7 +1.9	12.86 +.30	56.4 +1.7	37.18 +.72	36.6 +1.4	16.07 +.31	42.0 +1.9
27.7	14.52 .33	65.8 2.1	13.15 .29	54.8 1.5	37.89 .69	38.2 1.8	16.38 .30	43.9 1.9
Aug. 6.7	14.83 .30	68.0 2.3	13.43 .27	53.4 1.2	38.56 .65	40.2 2.2	16.66 .28	45.7 1.8
16.6	15.12 .27	70.3 2.3	13.69 .25	52.3 0.9	39.18 .59	42.6 2.5	16.93 .26	47.5 1.7
26.6	15.38 .24	72.7 2.4	13.92 .22	51.6 0.6	39.74 .53	45.3 2.8	17.17 .23	49.2 1.6
Sept. 5.6	15.60 +.20	75.0 +2.4	14.13 +.18	51.1 +0.3	40.23 +.45	48.3 +3.1	17.39 +.20	50.6 +1.4
15.6	15.78 .16	77.4 2.3	14.29 .15	51.0 0.0	40.65 .37	51.4 3.3	17.57 .16	52.0 1.2
25.5	15.92 .12	79.6 2.2	14.43 .12	51.1 −0.3	40.98 .29	54.8 3.4	17.71 .13	53.1 1.1
Oct. 5.5	16.02 .08	81.7 2.0	14.52 .08	51.6 0.6	41.23 .20	58.2 3.4	17.83 .10	54.1 0.9
15.5	16.08 .05	83.7 1.9	14.59 .05	52.2 0.8	41.38 .11	61.5 3.4	17.91 .07	54.8 0.6
25.5	16.12 +.01	85.4 +1.7	14.62 +.02	53.1 −1.0	41.45 +.02	64.9 +3.3	17.96 +.03	55.4 +0.5
Nov. 4.4	16.11 −.02	86.9 1.4	14.63 −.01	54.1 1.1	41.42 −.07	68.0 3.1	17.98 .00	55.7 0.3
14.4	16.07 .05	88.2 1.2	14.60 .04	55.2 1.1	41.30 .16	71.0 2.8	17.97 −.02	55.9 +0.1
24.4	16.00 .08	89.2 0.9	14.55 .06	56.4 1.2	41.10 .25	73.6 2.5	17.93 .05	55.9 −0.1
Dec. 4.3	15.90 −.11	89.9 +0.6	14.48 −.08	57.5 −1.1	40.81 −.33	75.9 +2.1	17.87 −.07	55.8 −0.2
14.3	15.78 .13	90.3 +0.2	14.39 .10	58.6 1.0	40.44 .40	77.8 1.6	17.79 .09	55.5 0.4
24.3	15.64 .15	90.4 −0.1	14.28 .11	59.6 0.9	40.02 .45	79.1 1.1	17.69 .11	55.0 0.5
34.3	15.48 −.17	90.1 −0.4	14.16 −.12	60.4 −0.8	39.54 −.50	79.9 +0.5	17.58 −.12	54.4 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Eridani. (*Achernar.*)		ο Piscium.		β Arietis.		50 Cassiopeæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$1^{h}\ 33^{m}$	$-57^{\circ}\ 49'$	$1^{h}\ 39^{m}$	$+\ 8^{\circ}\ 34'$	$1^{h}\ 48^{m}$	$+20^{\circ}\ 14'$	$1^{h}\ 53^{m}$	$+71^{\circ}\ 51'$
	s	″	s	″	s	″	s	″
(Dec. 30.3)	21.66 −.33	68.5 −0.8	14.25 −.11	9.4 −0.6	12.15 −.12	15.1 −0.4	31.81 −.50	34.6 +1.2
Jan. 9.3	21.32 .34	69.0 −0.2	14.13 .12	8.7 0.7	12.03 .13	14.6 0.6	31.28 .56	35.5 +0.6
19.2	20.98 .34	69.0 +0 4	14.00 .13	8.0 0.7	11.89 .14	14.0 0.7	30.70 .59	35.8 0.0
29.2	20.64 .33	68.3 0.9	13.87 .14	7.3 0.7	11.74 .15	13.2 0.8	30.10 .60	35.5 −0.6
Feb. 8.2	20.32 .31	67.2 1.4	13.73 .13	6.6 0.6	11.59 .15	12.4 0.9	29.50 .58	34.6 1.1
18.1	20.01 −.29	65.5 +1.9	13.60 −.12	6.0 −0.6	11.45 −.14	11.5 −0.9	28.94 −.54	33.2 −1.6
28.1	19.75 .25	63.4 2.3	13.49 .10	5.4 0.5	11.32 .12	10.5 0.9	28.43 .47	31.4 2.1
Mar. 10.1	19.52 .20	60.8 2.7	13.40 .08	5.0 0.4	11.22 .09	9.6 0.9	28.00 .38	29.1 2.4
20.1	19.35 .14	58.0 3.0	13.33 .05	4.7 −0.2	11.14 .06	8.7 0.8	27.68 .27	26.5 2.7
30.0	19.23 .08	54.8 3.2	13.30 −.01	4.6 0.0	11.10 −.02	7.9 0.7	27.47 .14	23.8 2.8
Apr. 9.0	19.18 −.02	51.5 +3.4	13.31 +.03	4.7 +0 2	11.10 +.02	7.4 −0.5	27.39 −.01	20.9 −2.8
19.0	19.20 +.05	48.0 3.5	13.36 .07	5.0 0.4	11.15 .07	7.0 −0.3	27.45 +.13	18.1 2.8
29.0	19.29 .12	44.4 3.5	13.46 .12	5.5 0.7	11.25 .12	6.8 0.0	27.64 .26	15.4 2.6
May 8.9	19.45 .19	40.9 3.5	13.60 .16	6.4 0.9	11.39 .17	6.9 +0.2	27.97 .38	12.9 2.3
18.9	19.67 .26	37.5 3.3	13.79 .20	7.4 1.2	11.58 .21	7.3 0.5	28.41 .50	10.8 2.0
28.9	19.96 +.32	34.3 +3.1	14.01 +.24	8.6 +1.4	11.81 +.25	7.9 +0.8	28.96 +.60	9.0 −1.5
June 7.8	20.31 .37	31.3 2.8	14.26 .27	10.1 1.5	12.07 .28	8.8 1.0	29.60 .68	7.7 1.1
17.8	20.70 .41	28.6 2.5	14.54 .29	11.7 1.7	12.36 .30	10.0 1.3	30.32 .74	6.9 0.6
27.8	21.14 .44	26.4 2.1	14.84 .30	13.4 1.8	12.67 .31	11.4 1.5	31.09 .78	6.6 −0.1
July 7.8	21.59 .46	24.5 1.6	15.14 .31	15.2 1.8	12.99 .32	12.9 1.6	31.89 .81	6.7 +0.4
17.7	22.06 +.47	23.2 +1.0	15.45 +.31	17.1 +1.8	13.31 +.32	14.6 +1.7	32.70 +.81	7.4 +0.9
27.7	22.53 .46	22.5 +0.5	15.76 .30	18.9 1.7	13.63 .31	16.3 1.8	33.50 .80	8.5 1.4
Aug. 6.7	22.98 .44	22.3 −0.1	16.04 .28	20.6 1.6	13.93 .30	18.1 1.8	34.28 .76	10.1 1.8
16.7	23.41 .41	22.6 0.7	16.32 .26	22.1 1.5	14.22 .28	19.9 1.8	35.02 .72	12.0 2.2
26.6	23.80 .37	23.6 1.2	16.56 .23	23.5 1.3	14.48 .25	21.6 1.7	35.71 .65	14.4 2.5
Sept. 5.6	24.14 +.31	25.1 −1.7	16.78 +.20	24.8 +1.1	14.72 +.22	23.2 +1.6	36.33 +.58	17.1 +2.8
15.6	24.42 .25	27.0 2.2	16.97 .17	25.8 0.9	14.92 .19	24.8 1.4	36.88 .51	20.0 3.1
25.5	24.64 .18	29.4 2.5	17.12 .14	26.6 0.7	15.10 .16	26.1 1.3	37.34 .42	23.2 3.2
Oct. 5.5	24.79 .11	32.0 2.8	17.25 .11	27.1 0.5	15.24 .12	27.3 1.1	37.71 .32	26.4 3.3
15.5	24.87 +.04	34.9 3.0	17.34 .08	27.5 0.3	15.34 .09	28.4 0.9	37.98 .22	29.8 3.3
25.5	24.88 −.03	37.9 −3.0	17.40 +.05	27.6 +0.1	15.42 +.06	29.2 +0.8	38.16 +.12	33.1 +3.3
Nov. 4.4	24.82 .09	40.9 2.9	17.44 +.02	27.6 −0.1	15.47 +.03	29.9 0.6	38.22 +.01	36.4 3.2
14.4	24.69 .15	43.8 2.8	17.44 −.01	27.4 0.3	15.48 .00	30.4 0.4	38.18 −.09	39.5 3.0
24.4	24.51 .21	46.4 2.5	17.42 .04	27.1 0.4	15.47 −.03	30.7 +0.2	38.04 .20	42.4 2.8
Dec. 4.4	24.28 −.25	48.7 −2.1	17.37 −.06	26 6 −0.5	15.43 −.06	30 8 0.0	37.79 − 30	45.0 +2.4
14.3	24.01 .29	50.6 1.6	17.30 .08	26.1 0.6	15.36 .08	30.8 −0.1	37.45 .39	47.2 2.0
24.3	23.70 .32	52.0 1.1	17.21 .10	25.5 0.6	15.27 .10	30.5 0.3	37.02 .47	48.9 1.5
34.3	23.38 −.34	52.8 −0.6	17.10 −.12	24.8 −0.7	15.15 −.13	30.2 −0.4	36.52 −.54	50.2 +1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Arietis.		ξ¹ Ceti.		ι Cassiopeæ.		ξ² Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$2^{\mathrm{h}}\ 0^{\mathrm{m}}$	$+22^{\circ}\ 54'$	$2^{\mathrm{h}}\ 6^{\mathrm{m}}$	$+\ 8^{\circ}\ 17'$	$2^{\mathrm{h}}\ 19^{\mathrm{m}}$	$+66^{\circ}\ 52'$	$2^{\mathrm{h}}\ 21^{\mathrm{m}}$	$+\ 7^{\circ}\ 56'$
	s	″	s	″	s	″	s	″
(Dec. 30.3)	36.35 −.11	38.2 −0.2	49.41 −.10	52.4 −0.6	29.82 −.35	47.9 +1.3	57.87 −.09	7.3 −0.7
Jan. 9.3	36.23 .13	37.8 0.5	49.30 .12	51.7 0.7	29.45 .40	48.9 0.8	57.77 .11	6.6 0.7
19.3	36.09 .15	37.3 0.6	49.17 .13	51.1 0.7	29.02 .44	49.4 +0.2	57.64 .13	5.9 0.7
29.2	35.94 .15	36.6 0.8	49.03 .14	50.4 0.7	28.57 .46	49.4 −0.3	57.51 .14	5.3 0.6
Feb. 8.2	35.78 .15	35.8 0.9	48.89 .14	49.8 0.6	28.10 .46	48.8 0.8	57.36 .15	4.7 0.6
18.2	35.63 −.15	34.8 −1.0	48.75 −.14	49.2 −0.6	27.65 −.44	47.7 −1.3	57.21 −.15	4.1 −0.5
28.2	35.49 .13	33.8 1.0	48.62 .12	48.7 0.5	27.22 .40	46.1 1.8	57.07 .13	3.6 0.4
Mar. 10.1	35.37 .11	32.8 1.0	48.50 .10	48.3 0.3	26.86 .34	44.2 2.1	56.95 .11	3.3 0.3
20.1	35.28 .07	31.8 0.9	48.41 .07	48.0 −0.2	26.56 .26	41.9 2.4	56.84 .09	3.0 −0.2
30.1	35.23 −.03	31.0 0.8	48.36 −.04	47.9 0.0	26.35 .16	39.4 2.6	56.77 .05	3.0 0.0
Apr. 9.1	35.22 +.01	30.2 −0.7	48.34 .00	48.0 +0.2	26.24 −.06	36.7 −2.7	56.74 −.01	3.1 +0.2
19.0	35.26 .06	29.6 0.5	48.36 +.05	48.3 0.4	26.23 +.05	34.0 2.6	56.75 +.03	3.4 0.4
29.0	35.34 .11	29.3 −0.2	48.44 .09	48.8 0.6	26.33 .16	31.5 2.5	56.81 .08	3.9 0.6
May 9.0	35.48 .16	29.2 0.0	48.55 .14	49.6 0.9	26.55 .26	29.1 2.3	56.91 .12	4.6 0.8
18.9	35.66 .20	29.4 +0.3	48.71 .18	50.6 1.1	26.86 .36	27.0 2.0	57.06 .17	5.6 1.1
28.9	35.88 +.24	29.8 +0.6	48.91 +.22	51.8 +1.3	27.27 +.45	25.2 −1.6	57.25 +.21	6.7 +1.3
June 7.9	36.14 .27	30.5 0.8	49.15 .25	53.1 1.5	27.76 .52	23.8 1.2	57.47 .24	8.1 1.4
17.9	36.43 .30	31.5 1.0	49.41 .28	54.7 1.6	28.31 .58	22.8 0.7	57.73 .27	9.6 1.5
27.8	36.74 .32	32.7 1.3	49.70 .29	56.3 1.7	28.92 .62	22.3 −0.3	58.00 .29	11.2 1.6
July 7.8	37.06 .33	34.1 1.5	50.00 .30	58.0 1.7	29.56 .65	22.2 +0.2	58.30 .30	12.8 1.7
17.8	37.39 +.33	35.7 +1.6	50.30 +.31	59.8 +1.7	30.22 +.66	22.6 +0.6	58.60 +.30	14.5 +1.7
27.7	37.71 .32	37.4 1.7	50.60 .30	61.4 1.7	30.89 .66	23.5 1.1	58.91 .30	16.2 1.6
Aug. 6.7	38.02 .31	39.1 1.7	50.90 .29	63.1 1.6	31.54 .64	24.8 1.5	59.20 .29	17.8 1.5
16.7	38.32 .29	40.8 1.7	51.18 .27	64.6 1.4	32.18 .61	26.5 1.9	59.49 .28	19.2 1.4
26.7	38.59 .26	42.6 1.7	51.45 .25	65.9 1.2	32.77 .57	28.5 2.2	59.76 .26	20.5 1.2
Sept. 5.6	38.84 +.23	44.2 +1.6	51.68 +.22	67.1 +1.0	33.32 +.53	30.9 +2.5	60.00 +.23	21.6 +1.0
15.6	39.06 .20	45.8 1.5	51.89 .20	68.0 0.8	33.82 .47	33.5 2.7	60.22 .21	22.5 0.8
25.6	39.25 .17	47.2 1.4	52.07 .17	68.7 0.6	34.25 .40	36.3 2.9	60.42 .18	23.2 0.6
Oct. 5.6	39.41 .14	48.6 1.2	52.22 .14	69.2 0.4	34.62 .33	39.3 3.0	60.58 .15	23.6 0.4
15.5	39.53 .11	49.7 1.1	52.34 .10	69.5 +0.2	34.92 .26	42.4 3.1	60.72 .12	23.9 +0.1
25.5	39.62 +.08	50.7 +0.9	52.43 +.07	69.6 0.0	35.14 +.18	45.5 +3.1	60.82 +.09	23.9 −0.1
Nov. 4.5	39.68 .04	51.5 0.7	52.49 .05	69.5 −0.2	35.27 .10	48.5 3.0	60.90 .06	23.8 0.2
14.4	39.71 +.01	52.2 0.6	52.52 +.02	69.3 0.3	35.33 +.01	51.5 2.9	60.94 +.03	23.5 0.4
24.4	39.71 −.02	52.6 0.4	52.53 −.01	68.9 0.4	35.30 −.08	54.3 2.7	60.96 .00	23.0 0.5
Dec. 4.4	39.68 −.05	52.9 +0.2	52.50 −.04	68.4 −0.5	35.18 −.16	56.8 +2.4	60.95 −.03	22.5 −0.5
14.4	39.62 .07	53.0 0.0	52.45 .07	67.9 0.6	34.98 .24	59.0 2.0	60.91 .06	22.0 0.6
24.3	39.53 .10	52.9 −0.2	52.37 .09	67.3 0.6	34.70 .31	60.8 1.6	60.84 .08	21.3 0.6
34.3	39.42 −.12	52.7 −0.4	52.27 −.11	66.6 −0.7	34.36 −.37	62.2 +1.1	60.74 −.11	20.7 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ceti.		α Ceti.		48 Cephei (H.)		ζ Arietis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 2 37	+ 2° 44′	h m 2 56	+ 3° 37′	h m 3 5	+77° 17′	h m 3 8	+20° 36′
	s	″	s	″	s	″	s	″
(Dec. 30.3)	15.84 −.09	30.5 −0.8	11.47 −.08	46.5 −0.8	38.04 −.56	84.0 +2.1	12.57 −.07	38.7 −0.2
Jan. 9.3	15.74 .11	29.7 0.8	11.38 .10	45.7 0.8	37.41 .69	85.8 1.6	12.48 .10	38.5 0.3
19.3	15.62 .13	29.0 0.7	11.26 .13	45.0 0.7	36.66 .79	87.1 1.0	12.37 .13	38.2 0.4
29.3	15.48 .14	28.3 0.6	11.12 .14	44.3 0.6	35.82 .86	87.9 +0.5	12.22 .15	37.8 0.5
Feb. 8.2	15.33 .15	27.8 0.5	10.97 .15	43.8 0.5	34.94 .90	88.0 −0.1	12.06 .16	37.2 0.6
18.2	15.18 −.15	27.3 −0.4	10.82 −.16	43.3 −0.4	34.04 −.89	87.6 −0 7	11.90 −.17	36.7 −0.6
28.2	15.03 .14	27.0 0.3	10.66 .15	43.0 0.3	33.17 .84	86.6 1.3	11.73 .17	36.0 0.7
Mar. 10.2	14.90 .12	26.8 −0.1	10.52 .14	42.7 −0.1	32.36 .76	85.1 1.8	11.57 .15	35.3 0.7
20.1	14.79 .10	26.8 +0.1	10.39 .11	42.7 0.0	31.65 .64	83.1 2.2	11.43 .13	34.6 0.7
30.1	14.70 .07	27.0 0.3	10.29 .08	42.8 +0.2	31.08 .49	80.8 2.5	11.32 .09	34.0 0.6
Apr. 9.1	14.66 −.03	27.3 +0.5	10.23 −.04	43.1 +0.4	30.67 −.33	78.1 −2.7	11.24 −.05	33.4 −0.5
19.0	14.65 +.02	27.9 0.7	10.21 .00	43.6 0.6	30.43 −.14	75.3 2.9	11.21 −.01	33.0 0.4
29.0	14.69 .06	28.7 0.9	10 23 +.04	44.3 0.8	30.38 +.05	72.4 2.9	11.22 +.04	32.7 −0.2
May 9.0	14.77 .11	29.7 1.1	10.29 .09	45.2 1.0	30.52 .24	69.6 2.8	11.29 .09	32.6 0.0
19.0	14.90 .15	30.9 1.3	10.41 .13	46.4 1.2	30.85 .42	66.8 2.6	11.40 .14	32.7 +0.2
28.9	15.07 +.19	32.3 +1.5	10.56 +.18	47.7 +1.4	31.36 +.59	64.4 −2.3	11.56 +.18	33.0 +0.4
June 7.9	15.28 .22	33.9 1.6	10.76 .21	49.1 1.5	32.02 .74	62.2 2.0	11.76 .22	33.5 0.6
17.9	15.52 .25	35.5 1.7	10.98 .24	50.7 1.6	32.82 .87	60.3 1.6	12.00 .25	34.2 0.8
27.8	15.79 .28	37.3 1.8	11.24 .27	52.3 1.7	33.75 .97	58.9 1.2	12.27 .28	35.1 .1.0
July 7.8	16.07 .29	39.0 1.8	11.52 .28	54.0 1.7	34.76 1.05	58.0 0.7	12.56 .30	36.1 1.1
17.8	16.37 +.30	40.8 +1.7	11.81 +.29	55.7 +1.6	35.85 1.11	57.5 −0.3	12.87 +.31	37.3 +1.2
27.8	16.67 .30	42.4 1.6	12.10 .30	57.3 1.5	36.98 1.14	57.4 +0.2	13.19 .32	38.6 1.3
Aug. 6.7	16.96 .29	43.9 1.4	12.40 .29	58.8 1.4	38.12 1.14	57.9 0.7	13.50 .31	39.9 1.3
16.7	17.25 .28	45.3 1.3	12 69 .28	60.1 1.2	39.26 1.13	58.8 1.1	13.82 .31	41.2 1.3
26.7	17.52 .26	46.4 1.0	12.97 .27	61.3 1.0	40.37 1.09	60.1 1.6	14.12 .29	42.5 1.3
Sept. 5.7	17.77 +.24	47.3 +0.8	13.23 +.25	62.2 +0.8	41.44 1.03	61.9 +1.9	14.40 +.28	43.8 +1.2
15.6	18.00 .22	48.0 0.5	13.47 .23	62.8 0.5	42.44 .96	64.0 2.3	14.66 .25	44.9 1.1
25.6	18.20 .19	48.4 +0.3	13.69 .20	63.2 +0.3	43.35 .86	66.5 2.6	14.91 .23	46.0 1.0
Oct. 5.6	18.38 .16	48.5 0.0	13.88 .18	63.4 0.0	44.16 .75	69.2 2.9	15.12 .20	46.9 0.9
15.5	18.53 .13	48.4 −0.2	14.04 .15	63.3 −0.2	44.85 .63	72.2 3.1	15.32 .18	47.7 0.7
25 5	18.64 +.10	48.1 −0.4	14.18 +.12	63.0 −0.4	45.42 +.49	75.4 +3.2	15.48 +.15	48.3 +0.6
Nov. 4.5	18.73 .07	47.6 0.6	14.20 .09	62.5 0.6	45.84 .34	78.6 3.3	15.61 .12	48.8 0.5
14.5	18.79 .04	47.0 0.7	14.37 .06	61.9 0.7	46.10 .18	81.9 3.3	15.71 .08	49.2 0.3
24.4	18.82 +.01	46.2 0.8	14.41 +.03	61.1 0.8	46.20 +.01	85.1 3.2	15.78 .05	49.5 0.2
Dec. 4.4	18.82 −.02	45.4 −0.8	14.43 .00	60.3 −0.8	46.13 −.15	88.2 +3.0	15.81 +.01	49.7 +0.1
14.4	18.78 .05	44.6 0.8	14.41 −.03	59.5 0.8	45.89 .32	91.1 2.7	15.81 −.02	49.7 0.0
24.4	18.72 .07	43.7 0.8	14.37 .06	58.7 0.8	45.49 .48	93.6 2.3	15.78 .05	49.7 −0.1
34.3	18.64 −.10	42.9 −0.8	14.29 −.09	57.8 −0.8	44.93 −.63	95.8 +1.9	15.70 −.09	49.6 −0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Persei.		ε Eridani.		δ Persei.		η Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 15	° ′ +49 26	h m 3 27	° ′ − 9 51	h m 3 34	° ′ +47 24	h m 3 40	° ′ +23 44
	s	″	s	″	s	″	s	″
(Dec. 30.4)	61.30 −.12	45.9 +1.1	26.76 −.07	23.6 −1.4	38.75 −.09	50.9 +1.2	33.95 −.06	33.9 0.0
Jan. 9.3	61.15 .17	46.9 0.8	26.68 .10	24.9 1.2	38.63 .14	51.9 0.8	33.88 .09	33.9 −0.1
19.3	60.96 .21	47.5 +0.4	26.56 13	26.0 1.0	38.46 .19	52.5 0.5	33.78 .12	33.8 0.2
29.3	60.74 .24	47.7 0.0	26.42 .15	26.9 0.8	38.26 22	52.9 +0.2	33.64 .15	33.6 0.3
Feb. 8.3	60.48 .26	47.6 −0.3	26.26 .16	27.5 0.5	38.02 .24	52.9 −0.2	33.48 .17	33.2 0.4
18.2	60.22 −.27	47.0 −0.7	26.09 −.17	27.9 −0.3	37.77 −.26	52.6 −0.5	33.30 −.18	32.8 −0.5
28.2	59.95 .26	46.2 1.0	25.91 .17	28.0 0.0	37.51 .25	51.9 0.8	33.12 .18	32.2 0.6
Mar. 10.2	59.70 .24	45.0 1.3	25.74 .16	27.9 +0.3	37.26 .24	50.9 1.1	32.94 .17	31.6 0.6
20.1	59.48 .20	43.5 1.6	25.59 .14	27.5 0.5	37.04 .21	49.6 1.4	32.78 .15	31.0 0.7
30.1	59.31 .15	41.8 1.7	25.46 .11	26.8 0.8	36.85 .16	48.1 1.6	32.64 .12	30.3 0.7
Apr. 9.1	59.18 −.10	40.0 −1.8	25.36 −.08	25.9 +1.0	36.71 −.11	46.5 −1.7	32.54 −.08	29.6 −0.6
19.1	59.12 −.03	38.2 1.9	25.30 −.04	24.7 1.3	36.62 −.05	44.8 1.7	32.48 −.04	29.0 0.5
29.0	59.12 +.03	36.3 1.8	25.28 .00	23.3 1.5	36.60 +.01	43.0 1.7	32.46 +.01	28.6 0.4
May 9.0	59.19 .10	34.6 1.7	25.31 +.05	21.7 1.7	36.65 .08	41.4 1.6	32.49 .06	28.2 0.3
19.0	59.33 .17	33.0 1.5	25.38 .10	19.9 1.9	36.76 .14	39.9 1.4	32.58 .11	28.0 −0.1
29.0	59.53 +.23	31.6 −1.2	25.50 +.14	18.0 +2.0	36.93 +.20	38.6 −1.2	32.71 +.16	28.0 +0.1
June 7.9	59.79 .29	30.6 0.9	25.66 .18	16.0 2.1	37.17 .26	37.5 1.0	32.88 .20	28.2 0.3
17.9	60.11 .34	29.8 0.6	25.85 .21	13.9 2.1	37.45 .31	36.6 0.7	33.10 .23	28.6 0.5
27.9	60.47 .38	29.3 −0.3	26.08 .24	11.8 2.1	37.78 .35	36.1 0.4	33.35 .27	29.2 0.6
July 7.8	60.86 .40	29.2 0.0	26.33 .26	9.7 2.0	38.15 .38	35.8 −0.1	33.64 .29	29.9 0.8
17.8	61.28 +.42	29.4 +0.3	26.60 +.28	7.8 +1.9	38.54 +.40	35.9 +0.2	33.94 +.31	30.8 +0.9
27.8	61.70 .43	29.9 0.7	26.89 .29	6.0 1.7	38.95 .41	36.3 0.5	34.25 .32	31.8 1.0
Aug. 6.8	62.14 .43	30.7 1.0	27.18 .29	4.5 1.4	39.37 .42	36.9 0.8	34.57 .32	32.8 1.1
16.7	62.57 .42	31.8 1.2	27.47 .28	3.2 1.1	39.78 .41	37.8 1.0	34.89 .32	33.9 1.1
26.7	62.98 .41	33.2 1.4	27.75 .28	2.3 0.8	40.19 .40	39.0 1.2	35.20 .31	35.0 1.1
Sept. 5.7	63.38 +.39	34.7 +1.6	28.02 +.26	1.7 +0.4	40.59 +.39	40.3 +1.4	35.51 +.30	36.1 +1.1
15.7	63.76 .36	36.5 1.8	28.27 .24	1.4 0.0	40.96 .36	41.8 1.6	35.79 .28	37.2 1.0
25.6	64.11 .33	38.3 1.9	28.51 .22	1.6 −0.3	41.32 .34	43.4 1.7	36.06 .26	38.1 0.9
Oct. 5.6	64.42 .30	40.3 2.0	28.72 .20	2.0 0.6	41.64 .31	45.2 1.8	36.31 .24	39.0 0.8
15.6	64.70 .26	42.4 2.1	28.90 .17	2.9 1.0	41.93 .27	47.0 1.9	36.54 .21	39.8 0.7
25.5	64.93 +.22	44.5 +2.1	29.06 +.14	4.0 −1.2	42.19 +.24	48.9 +1.9	36.74 +.19	40.4 +0.6
Nov. 4.5	65.13 .17	46.6 2.1	29.19 .11	5.3 1.4	42.40 .19	50.8 1.9	36.91 .16	41.0 0.5
14.5	65.27 .12	48.7 2.0	29.29 .08	6.7 1.5	42.57 .15	52.7 1.9	37.04 .13	41.5 0.5
24.5	65.37 .07	50.7 1.9	29.35 .05	8.3 1.6	42.69 .10	54.5 1.8	37.15 .09	41.9 0.4
Dec. 4.4	65.41 +.02	52.5 +1.8	29.39 +.02	10.0 −1.6	42.76 +.04	56.3 +1.7	37.22 +.05	42.2 +0.3
14.4	65.40 −.04	54.2 1.6	29.38 −.02	11.5 1.5	42.78 −.01	57.9 1.5	37.25 +.01	42.5 0.2
24.4	65.33 .09	55.6 1.3	29.35 .05	13.0 1.4	42.74 .06	59.3 1.3	37.24 −.03	42.6 +0.1
34.4	65.21 −.14	56.8 +1.0	29.28 −.09	14.4 −1.3	42.65 −.12	60.4 +1.0	37.19 −.07	42.7 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Persei.		γ Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 46	° ′ +31 32	h m 3 52	° ′ -13 50	h m 4 13	° ′ +15 20	h m 4 21	° ′ +18 55
	s	″	s	″	s	″	s	″
(Dec. 30.4)	49.07 -.05	8.9 +0.4	36.03 -.06	39.5 -1.6	10.26 -.02	36.5 -0.4	49.30 -.02	9.4 -0.2
Jan. 9.4	49.00 .09	9.2 0.3	35.96 .09	41.0 1.4	10.22 .06	36.2 0.4	49.27 .06	9.2 0.2
19.3	48.89 .13	9.4 +0.1	35.85 .12	42.3 1.2	10.14 .10	35.8 0.4	49.19 .09	9.0 0.2
29.3	48.74 .16	9.4 -0.1	35.71 .15	43.3 0.9	10.02 -.13	35.4 0.4	49.08 .13	8.7 0.3
Feb. 8.3	48.57 .18	9.2 0.3	35.55 .17	44.1 0.6	9.88 .16	35.0 0.4	48.93 .16	8.4 0.3
18.3	48.38 -.20	8.9 -0.5	35.37 -.18	44.6 -0.3	9.71 -.17	34.6 -0.4	48.77 -.17	8.1 -0.3
28.2	48.18 .20	8.3 0.6	35.19 .18	44.8 0.0	9.53 .18	34.3 0.4	48.59 .18	7.8 0.4
Mar. 10.2	47.98 .19	7.6 0.8	35.01 .17	44.6 +0.3	9.36 .17	33.9 0.4	48.40 .18	7.4 0.4
20.2	47.80 .17	6.8 0.9	34.84 .16	44.2 0.6	9.19 .16	33.6 0.3	48.23 .17	7.0 0.4
30.1	47.65 .14	5.9 0.9	34.69 .14	43.5 0.8	9.04 .14	33.2 0.3	48.07 .15	6.6 0.4
Apr. 9.1	47.53 -.10	4.9 -1.0	34.57 -.10	42.5 +1.1	8.91 -.11	33.0 -0.2	47.94 -.11	6.3 -0.3
19.1	47.46 -.05	4.0 0.9	34.49 .06	41.2 1.4	8.83 .07	32.9 -0.1	47.85 .07	6.0 0.3
29.1	47.44 .00	3.1 0.9	34.44 -.02	39.7 1.6	8.78 -.02	32.9 0.0	47.79 -.03	5.8 -0.2
May 9.0	47.47 +.06	2.2 0.7	34.44 +.02	38.0 1.8	8.78 +.02	33.0 +0.2	47.78 +.02	5.6 0.0
19.0	47.55 .11	1.6 0.6	34.49 .07	36.1 2.0	8.83 .07	33.2 0.3	47.82 .06	5.7 +0.1
29.0	47.68 +.16	1.1 -0.4	34.58 +.11	34.0 +2.1	8.92 +.12	33.6 +0.5	47.91 +.11	5.9 +0.3
June 8.0	47.86 .20	0.8 -0.2	34.72 .16	31.8 2.2	9.06 .16	34.2 0.6	48.05 .15	6.2 0.4
17.9	48.09 .25	0.8 0.0	34.89 .19	29.6 2.2	9.24 .20	34.9 0.8	48.22 .19	6.6 0.5
27.9	48.36 .28	0.9 +0.2	35.10 .22	27.4 2.2	9.45 .23	35.7 0.9	48.43 .23	7.3 0.7
July 7.9	48.65 .30	1.2 0.4	35.34 .25	25.2 2.1	9.70 .26	36.6 1.0	48.68 .26	8.0 0.8
17.8	48.97 +.32	1.8 +0.6	35.60 +.27	23.1 +2.0	9.96 +.28	37.7 +1.0	48.94 +.28	8.8 +0.8
27.8	49.30 .34	2.5 0.8	35.88 .28	21.3 1.7	10.25 .29	38.7 1.0	49.23 .29	9.7 0.9
Aug. 6.8	49.64 .34	3.4 0.9	36.17 .29	19.7 1.5	10.55 .30	39.7 1.0	49.53 .30	10.6 0.9
16.8	49.98 .34	4.3 1.0	36.46 .29	18.4 1.1	10.85 .30	40.7 1.0	49.84 .31	11.4 0.9
26.7	50.32 .33	5.4 1.1	36.75 .29	17.4 0.7	11.15 .30	41.7 0.9	50.14 .31	12.3 0.8
Sept. 5.7	50.64 +.32	6.5 +1.1	37.03 +.27	16.9 +0.4	11.44 +.29	42.5 +0.8	50.45 +.30	13.1 +0.7
15.7	50.95 .30	7.6 1.1	37.29 .26	16.7 0.0	11.73 .28	43.2 0.6	50.74 .29	13.8 0.6
25.7	51.25 .28	8.7 1.1	37.55 .24	17.0 -0.4	12.00 .27	43.7 0.5	51.02 .28	14.4 0.5
Oct. 5.6	51.52 .26	9.9 1.1	37.78 .22	17.6 0.8	12.26 .25	44.1 0.3	51.29 .26	14.8 0.4
15.6	51.76 .23	11.0 1.1	37.98 .20	18.6 1.1	12.50 .23	44.4 +0.2	51.54 .24	15.2 0.3
25.6	51.98 +.20	12.0 +1.0	38.16 +.17	19.9 -1.4	12.71 +.20	44.4 0.0	51.77 +.22	15.4 +0.2
Nov. 4.5	52.17 .17	13.0 1.0	38.32 .14	21.4 1.6	12.90 .18	44.4 -0.1	51.97 .19	15.5 +0.1
14.5	52.33 .14	13.9 0.9	38.44 .11	23.2 1.8	13.07 .15	44.3 0.2	52.15 .16	15.6 0.0
24.5	52.45 .10	14.8 0.8	38.53 .07	25.0 1.9	13.20 .12	44.1 0.2	52.29 .13	15.5 -0.1
Dec. 4.5	52.53 +.06	15.6 +0.7	38.59 +.04	27.0 -1.9	13.30 +.08	43.8 -0.3	52.40 +.09	15.5 -0.1
14.4	52.57 +.02	16.3 0.6	38.61 .00	28.8 1.8	13.36 +.04	43.5 0.3	52.47 .05	15.3 0.1
24.4	52.56 -.02	16.9 0.5	38.59 -.04	30.6 1.7	13.38 .00	43.1 0.3	52.50 +.01	15.2 0.1
34.4	52.52 -.06	17.4 +0.4	38.53 -.07	32.2 -1.5	13.36 -.04	42.8 -0.3	52.49 -.03	15.1 -0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Tauri. (*Aldebaran.*)		α Camelopardalis.		ι Aurigæ.		11 Orionis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 4 29	° ′ +16 16	h m 4 42	° ′ +66 8	h m 4 49	° ′ +32 58	h m 4 57	° ′ +15 14
	s	″	s	″	s	″	s	″
(Dec. 30.4)	14.63 −.01	19.9 −0.3	30.23 −.07	33.9 +2.3	25.09 +.01	45.0 +0.6	55.24 +.02	19.4 −0.4
Jan. 9.4	14.60 .05	19.6 0.3	30.11 .17	36.1 2.1	25.08 −.04	45.6 0.5	55.23 −.03	19.0 0.4
19.4	14.53 .09	19.2 0.3	29.90 .26	38.0 1.7	25.01 .09	46.1 0.4	55.18 .07	18.6 0.4
29.3	14.42 .12	18.9 0.3	29.59 .34	39.6 1.3	24.90 .13	46.4 0.3	55.10 .11	18.3 0.3
Feb. 8.3	14.28 .15	18.6 0.3	29.21 .41	40.7 0.9	24.75 .17	46.6 +0.1	54.97 .14	18.0 0.3
18.3	14.12 −.17	18.2 −0.3	28.78 −.45	41.4 +0.4	24.56 −.19	46.7 0.0	54.81 −.16	17.7 −0.3
28.2	13.94 .18	17.9 0.3	28.31 .47	41.6 −0.1	24.36 .21	46.6 −0.2	54.64 .18	17.4 0.3
Mar. 10.2	13.76 .18	17.6 0.3	27.83 .47	41.2 0.6	24.15 .21	46.3 0.4	54.46 .18	17.2 0.2
20.2	13.58 .17	17.2 0.3	27.37 .45	40.4 1.0	23.94 .20	45.8 0.5	54.27 .18	17.0 0.2
30.2	13.42 .15	16.9 0 3	26.94 .40	39.2 1.4	23.75 .18	45.2 0.7	54.10 .16	16.8 0.2
Apr. 9.1	13.29 −.12	16.7 −0.2	26.57 −.34	37.6 −1.8	23.58 −.15	44.5 −0.8	53.95 −.14	16.6 −0.1
19.1	13.19 .08	16.5 −0.1	26.28 .25	35.7 2.1	23.45 .11	43.7 0.8	53.83 .10	16.5 −0.1
29.1	13.13 −.04	16.4 0.0	26.07 .16	33.5 2.3	23.36 .06	42.9 0.8	53.75 .06	16.5 0.0
May 9.1	13.12 +.01	16.5 +0.1	25.96 −.06	31.2 2.4	23.33 −.01	42.0 0.8	53.71 −.02	16.6 +0.1
19.0	13.15 .06	16.6 0.2	25 95 +.05	28.8 2.4	23.34 +.04	41.2 0.7	53.72 +.02	16.8 0.3
29.0	13.23 +.10	17.0 +0.4	26.05 +.15	26.4 −2.3	23.41 +.09	40.5 −0.6	53.77 +.07	17.1 +0.4
June 8.0	13.35 .14	17.4 0.5	26.25 .25	24.1 2.2	23.53 .14	40.0 0.5	53.86 .12	17.5 0.5
17.9	13.52 .18	18.0 0.7	26.54 .34	22.0 2.1	23.70 .19	39.5 0.4	54.00 .16	18.1 0.6
27.9	13.72 .22	18.7 0.8	26.92 .42	20.0 1.8	23.91 .23	39.2 0.2	54.18 .19	18.7 0.7
July 7.9	13.95 .25	19.5 0.9	27.38 .49	18.4 1.5	24.16 .26	39.0 −0.1	54.39 .22	19.4 0.8
17.9	14.21 +.27	20.4 +0.9	27.91 +.55	17.0 −1.2	24.44 +.29	39.0 +0.1	54.62 +.25	20.2 +0 8
27.8	14.49 .29	21.3 0.9	28.48 .60	16.0 0.9	24.74 .31	39.2 0.2	54.89 .27	21.0 0.8
Aug. 6.8	14.78 .30	22.2 0.9	29.10 .63	15.3 0.5	25.06 .33	39.4 0.3	55.16 .28	21.9 0.8
16.8	15.08 .30	23.1 0.9	29.74 .65	14.9 −0.2	25.40 .34	39.8 0.4	55.45 .29	22.6 0.7
26.8	15.38 .30	24.0 0.8	30.41 .66	14.9 +0.2	25.74 .34	40.3 0.5	55.75 .30	23.3 0 6
Sept. 5.7	15.68 +.30	24.7 +0.7	31.07 +.66	15.3 +0.5	26.08 +.34	40.8 +0.6	56.04 +.30	23.9 +0.5
15.7	15.97 .29	25.3 0.6	31.73 .65	16.0 0.9	26.42 .33	41.4 0.6	56.34 .29	24.3 0.4
25.7	16.25 .27	25.8 0.4	32.38 .63	17.1 1.2	26.74 .32	42.0 0.6	56.63 .28	24.6 0.2
Oct. 5.6	16.52 .26	26.1 0.3	32.99 .60	18.4 1.5	27.06 .31	42.6 0.7	56.91 .27	24.8 +0.1
15.6	16.77 .24	26.3 +0.1	33.57 .56	20.1 1.8	27.36 .29	43.3 0.7	57.17 .26	24.8 0.0
25.6	17.00 +.22	26.4 0.0	34.11 +.50	22 0 +2.0	27.64 +.27	44.0 +0.7	57.42 +.24	24.7 −0.2
Nov. 4.6	17.21 .19	26.3 −0.1	34.58 .44	24.2 2.3	27.90 .24	44.7 0.7	57.65 .22	24.4 0.3
14.5	17.39 .16	26.2 0.2	34.99 .37	26.5 2.4	28.13 .21	45.4 0.7	57.86 .19	24.1 0.4
24.5	17.54 .13	26.0 0.2	35.31 .28	29.0 2.5	28.32 .17	46.1 0.7	58.03 .16	23.7 0.4
Dec. 4.5	17.65 +.10	25.7 −0.3	35.55 +.19	31.6 +2.6	28.48 +.13	46.8 +0.7	58.18 +.12	23.3 −0.4
14.5	17.73 .06	25.4 0.3	35.70 +.09	34.1 2.5	28.59 .09	47.5 0.7	58.28 .08	22.9 0.4
24.4	17.77 +.02	25.1 0.3	35.74 −.01	36.6 2.4	28.65 +.04	48.2 0.7	58.34 +.04	22.5 0.4
34.4	17.76 −.03	24.8 −0.3	35.68 −.11	39.4 +2.2	28.66 −.01	48.8 +0.6	58 36 .00	22.1 −0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Aurigæ. (*Capella.*)		β Orionis. (*Rigel.*)		β Tauri.		Groombridge 966.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 5 8	+45° 52′	h m 5 8	− 8° 20′	h m 5 18	+28° 30′	h m 5 24	+74° 57′
	s	″	s	″	s	″	s	″
(Dec. 30.4)	5.91 +.03	37.5 +1.4	56.94 +.01	24.2 −1.7	56.29 +.05	22.2 +0.4	12.94 −.01	47.8 +2.8
Jan. 9.4	5.91 −.04	38.8 1.3	56.93 −.03	25.8 1.5	56.30 −.01	22.5 0.3	12.85 .18	50.5 2.6
19.4	5.84 .10	40.0 1.1	56.88 .07	27.2 1.3	56.27 .06	22.9 0.3	12.59 .23	53.0 2.3
29.4	5.71 .15	40.9 0.9	56.78 .11	28.5 1.1	56.18 .10	23.1 0.2	12.18 .48	55.2 2.0
Feb. 8.3	5.54 .20	41.7 0.6	56.66 .14	29.5 0.9	56.06 .14	23.4 0.2	11.64 .60	57.0 1.6
18.3	5.32 −.23	42.2 +0.3	56.50 −.17	30.2 −0.6	55.90 −.17	23.5 +0.1	11.00 −.69	58.3 +1.1
28.3	5.07 .25	42.4 0.0	56.32 .18	30.8 0.4	55.71 .19	23.5 −0.1	10.27 .75	59.1 +0.6
Mar. 10.2	4.81 .26	42.2 −0.3	56.14 .19	31.0 −0.1	55.51 .20	23.3 0.2	9.51 .77	59.4 0.0
20.2	4.55 .25	41.8 0.6	55.95 .18	31.0 +0.1	55.31 .20	23.1 0.3	8.74 .76	59.2 −0.5
30.2	4.30 .23	41.1 0.8	55.77 .17	30.8 0.4	55.11 .18	22.7 0.4	7.99 .71	58.4 1.0
Apr. 9.2	4.09 −.20	40.2 −1.1	55.61 −.15	30.3 +0.6	54.94 −.16	22.3 −0.5	7.32 −.64	57.1 −1.5
19.1	3.91 .15	39.0 1.2	55.48 .12	29.5 0.9	54.79 .13	21.8 0.5	6.73 .53	55.4 1.9
29.1	3.78 .10	37.7 1.4	55.38 .08	28.5 1.1	54.69 .08	21.2 0.6	6.26 .41	53.2 2.2
May 9.1	3.71 −.04	36.3 1.4	55.32 −.04	27.3 1.3	54.63 −.04	20.6 0.5	5.92 .27	50.9 2.5
19.1	3.69 +.02	34.8 1.4	55.30 .00	25.9 1.5	54.61 +.01	20.1 0.5	5.73 −.11	48.3 2.6
29.0	3.74 +.08	33.4 −1.4	55.32 +.05	24.4 +1.7	54.65 +.06	19.6 −0.4	5.69 +.04	45.6 −2.7
June 8.0	3.85 .14	32.0 1.3	55.39 .09	22.6 1.8	54.73 .11	19.2 0.3	5.81 .20	42.9 2.7
18.0	4.02 .20	30.8 1.2	55.50 .13	20.8 1.8	54.86 .15	18.9 0.3	6.08 .34	40.2 2.6
27.9	4.24 .25	29.6 1.0	55.65 .16	18.9 1.9	55.04 .19	18.7 −0.2	6.50 .48	37.7 2.4
July 7.9	4.51 .29	28.7 0.9	55.83 .20	17.1 1.8	55.25 .23	18.6 0.0	7.04 .61	35.3 2.2
17.9	4.82 +.33	27.9 −0.7	56.04 +.22	15.3 +1.8	55.50 +.26	18.6 +0.1	7.71 +.72	33.2 −2.0
27.9	5.16 .36	27.4 0.5	56.27 .24	13.6 1.6	55.77 .28	18.8 0.2	8.47 .81	31.4 1.6
Aug. 6.8	5.53 .38	27.0 0.3	56.53 .26	12.0 1.4	56.06 .30	19.0 0.2	9.32 .89	29.9 1.3
16.8	5.92 .39	26.8 −0.1	56.79 .27	10.7 1.2	56.37 .31	19.2 0.3	10.24 .95	28.8 0.9
26.8	6.32 .40	26.8 +0.1	57.07 .28	9.7 0.9	56.68 .32	19.5 0.3	11.21 .99	28.0 0.6
Sept. 5.8	6.72 +.40	27.0 +0.3	57.35 +.28	9.0 +0.5	57.01 +.32	19.8 +0.3	12.22 1.01	27.7 −0.2
15.7	7.12 .40	27.4 0.5	57.63 .28	8.6 +0.2	57.33 .32	20.1 0.3	13.23 1.02	27.8 +0.2
25.7	7.52 .39	27.9 0.6	57.91 .27	8.6 −0.2	57.66 .32	20.4 0.3	14.25 1.01	28.2 0.6
Oct. 5.7	7.91 .38	28.6 0.8	58.18 .26	9.0 0.6	57.97 .31	20.7 0.3	15.25 .98	29.0 1.0
15.6	8.28 .36	29.5 0.9	58.43 .25	9.8 0.9	58.28 .30	21.0 0.3	16.21 .93	30.3 1.4
25.6	8.63 +.34	30.5 +1.1	58.67 +.23	10.9 −1.2	58.57 +.28	21.2 +0.3	17.11 +.87	31.9 +1.8
Nov. 4.6	8.96 .31	31.6 1.2	58.89 .21	12.2 1.5	58.84 .26	21.5 0.3	17.94 .78	33.8 2.1
14.6	9.25 .27	32.8 1.3	59.09 .18	13.8 1.7	59.08 .23	21.8 0.3	18.66 .67	36.1 2.4
24.5	9.50 .23	34.1 1.4	59.26 .15	15.5 1.8	59.30 .20	22.0 0.3	19.28 .55	38.6 2.6
Dec. 4.5	9.70 +.18	35.5 +1.4	59.39 +.12	17.3 −1.8	59.48 +.16	22.4 +0.3	19.76 +.41	41.3 +2.8
14.5	9.85 .12	36.9 1.4	59.49 .08	19.2 1.8	59.62 .12	22.7 0.4	20.10 .26	44.1 2.8
24.5	9.94 +.06	38.4 1.4	59.54 +.04	21.0 1.8	59.71 .07	23.1 0.4	20.28 +.10	46.9 2.9
34.4	9.97 .00	39.7 +1.3	59.56 −.01	22.7 −1.6	59.76 +.02	23.4 +0.4	20.29 −.07	49.7 +2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Orionis.		α Leporis.		ε Orionis.		α Columbæ.	
	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	h m 5 26	− 0° 23′	h m 5 27	−17° 54′	h m 5 30	− 1° 16′	h m 5 35	−34° 8′
	s	″	s	″	s	″	s	″
(Dec. 30.4)	3.88 +.03	20.1 −1.4	36.26 +.02	34.3 −2.2	18.71 +.04	47.5 −1.4	26.94 .00	24.4 −2.9
Jan. 9.4	3.89 −.01	21.4 1.2	36.25 −.03	36.4 2.0	18.73 −.01	48.8 1.3	26.91 −.05	27.2 2.7
19.4	3.86 .05	22.6 1.1	36.20 .07	38.4 1.8	18.70 .05	50.0 1.1	26.83 .10	29.8 2.4
29.4	3.78 .09	23.6 0.9	36.11 .11	40.0 1.5	18.63 .09	51.1 1.0	26.71 .15	31.9 2.0
Feb. 8.3	3.67 .13	24.4 0.7	35.97 .15	41.4 1.2	18.52 .13	51.9 0.8	26.54 .18	33.8 1.6
18.3	3.53 −.16	25.0 −0.6	35.81 −.17	42.4 −0.9	18.37 −.16	52.6 −0.6	26.34 −.22	35.1 −1.2
28.3	3.36 .17	25.5 0.4	35.62 .19	43.1 0.5	18.20 .17	53.1 0.4	26.11 .24	36.1 0.7
Mar. 10.3	3.18 .18	25.8 −0.2	35.42 .20	43.5 −0.2	18.02 .18	53.4 −0.2	25.86 .25	36.6 −0.3
20.2	3.00 .18	25.9 0.0	35.22 .20	43.5 +0.1	17.84 .18	53.5 0.0	25.62 .25	36.6 +0.2
30.2	2.82 .17	25.8 +0.2	35.02 .19	43.2 0.5	17.66 .17	53 4 +0.2	25.37 .23	36.2 0.6
Apr. 9.2	2.66 −.15	25.5 +0.4	34.84 −.17	42.6 +0.8	17.50 −.15	53.1 +0.4	25.15 −.21	35.4 +1.0
19.1	2.52 .12	25.1 0.5	34.69 .14	41.6 1.1	17.36 .12	52.6 0.6	24.94 .18	34.1 1.4
29.1	2.42 .09	24.4 0.7	34.56 .11	40.4 1.4	17.25 .09	52.0 0.7	24.78 .15	32.5 1.8
May 9.1	2.35 −.05	23.6 0.9	34.48 .07	38.9 1.6	17.18 .05	51.2 0.9	24.65 .11	30.5 2.1
19.1	2.32 .00	22.7 1.0	34.43 −.02	37.1 1.8	17.15 −.01	50.2 1.1	24.57 .06	28.2 2.4
29.0	2.34 +.04	21.6 +1.2	34.43 +.02	35.2 +2.0	17.16 +.04	49.0 +1.2	24.53 −.01	25.7 +2.6
June 8.0	2.40 .08	20.3 1.3	34.47 .06	33.1 2.2	17.21 .08	47.7 1.3	24.54 +.04	23.0 2.8
18.0	2.49 .12	19.0 1.4	34.56 .10	30.9 2.3	17.31 .11	46.3 1.4	24.60 .08	20.2 2.9
28.0	2.63 .16	17.5 1.4	34.68 .14	28.6 2.3	17.44 .15	44.9 1.5	24.71 .13	17.3 2.9
July 7.9	2.80 .19	16.1 1.5	34.84 .18	26.3 2.2	17.61 .18	43.4 1.5	24.86 .17	14.5 2.8
17.9	3.01 +.21	14.6 +1.4	35.04 +.21	24.1 +2.1	17.81 +.21	41.9 +1.4	25.04 +.21	11.8 +2.6
27.9	3.23 .24	13.3 1.3	35.26 .23	22.1 1.9	18.03 .23	40.5 1.3	25.27 .24	9.2 2.4
Aug. 6.8	3.48 .25	12.0 1.2	35.50 .25	20.3 1.7	18.28 .25	39.2 1.2	25.52 .26	7.0 2.1
16.8	3.74 .27	10.9 1.0	35.76 .27	18.7 1.4	18.53 .26	38.2 1.0	25.80 .29	5.1 1.7
26.8	4.01 .28	10.1 0.8	36.04 .28	17.5 1.0	18.80 .27	37.3 0.8	26.09 .30	3.6 1.2
Sept. 5.8	4.29 +.28	9.4 +0.5	36.32 +.28	16.7 +0.6	19.08 +.28	36.6 +0.5	26.40 +.31	2.7 +0.7
15.7	4.57 .28	9.1 +0.2	36.60 .29	16.3 +0.2	19 36 .28	36.3 +0.2	26.71 .32	2.2 +0.2
25.7	4.85 .28	9.0 −0.1	36.89 .28	16.4 −0.3	19.64 .28	36.2 −0.1	27.03 .31	2.4 −0.4
Oct. 5.7	5.13 .27	9.3 0.4	37.17 .28	16.9 0.7	19.92 .27	36.5 0.4	27.34 .30	3.0 1.0
15.7	5.39 .26	9.8 0.7	37.44 .26	17.9 1.2	20.18 .26	37.1 0.7	27.63 .29	4.3 1.5
25.6	5.64 +.24	10.6 −0.9	37.69 +.24	19.2 −1.5	20.44 +.25	37.9 −1.0	27.91 +.27	6.0 −2.0
Nov. 4.6	5.88 .22	11.6 1.1	37.93 .22	21.0 1.8	20.68 .23	39.0 1.2	28.17 .24	8.2 2.4
14.6	6.09 .20	12.9 1.3	38.14 .20	23.0 2.1	20.89 .20	40.3 1.4	28.40 .21	10.7 2.7
24.5	6.28 .17	14.2 1.4	38.32 .16	25.2 2.3	21.08 .17	41.7 1.5	28.59 .17	13.5 2.9
Dec. 4.5	6.44 + 14	15.7 −1.4	38.46 +.13	27.5 −2.4	21.24 +.14	43.2 −1.5	28.74 +.13	16 5 −3.0
14.5	6.56 .10	17.1 1.4	38.57 .09	29.9 2.4	21.36 .10	44.7 1.5	28.84 .08	19.6 3.1
24.5	6.64 .06	18.6 1.4	38.64 +.04	32.2 2.3	21.45 .06	46.2 1.4	28.90 +.03	22.6 3.0
34.4	6.67 +.01	19.9 −1.3	38.66 .00	34.4 −2.0	21.49 +.02	47.6 −1.3	28.90 −.03	25 5 −2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Orionis.		ν Orionis.		22 Camelop. (H.)		μ Geminorum.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 5 48	° ′ + 7 22	h m 6 0	° ′ +14 46	h m 6 5	° ′ +69 21	h m 6 15	° ′ +22 34
	s	″	s	″	s	″	s	″
(Dec. 30.5)	52.47 +.06	55.1 −1.0	55.85 +.08	44.8 −0.5	62.43 +.14	25.4 +2.6	55.37 +.10	12.4 −0.1
Jan. 9.5	52.50 +.01	54.2 0.9	55.90 +.03	44.3 0.5	62.50 .00	27.9 2.5	55.44 +.05	12.3 0.0
19.4	52.49 −.03	53.4 0.7	55.91 −.02	43.9 0.4	62 44 −.13	30.4 2.4	55.47 .00	12.4 +0.1
29.4	52.44 .07	52.7 0.6	55.87 .07	43.5 0.3	62.25 .24	32.6 2.1	55.44 −.05	12.4 0.1
Feb. 8.4	52.34 .11	52.2 0.5	55.78 .11	43.3 0.2	61.95 .35	34 6 1.8	55.36 .10	12.6 0.1
18.3	52.21 −.14	51.7 −0.4	55.65 −.14	43.1 −0.2	61.55 −.44	36.3 +1.5	55.24 −.14	12.7 0.1
28.3	52.06 .17	51.4 0.3	55.50 .17	43.0 0.1	61.08 .50	37.5 1.0	55.08 .17	12.8 0.1
Mar. 10.3	51.88 .18	51.2 0.2	55.32 .18	42.9 0.1	60.55 .54	38.3 +0.5	54.90 .19	12.9 +0.1
20.3	51.70 .18	51.0 −0.1	55.14 .19	42.8 −0.1	60.00 .56	38.6 0.0	54.71 .19	12.9 0.0
30.2	51.52 .17	51.0 0.0	54.95 .18	42.7 0.0	59.44 .54	38.3 −0.5	54.52 .19	12.9 −0.1
Apr. 9.2	51.35 −.16	51.1 +0.2	54.78 −.16	42.7 0.0	58.91 −.51	37.6 −0.9	54.33 −.18	12.8 −0.1
19.2	51.20 .13	51.3 0.3	54.63 .14	42.8 0.0	58.43 .45	36.4 1.4	54.17 .15	12.7 0.1
29.2	51.09 .10	51.6 0.4	54.50 .10	42.8 +0.1	58.03 .36	34.9 1.8	54.03 .12	12.5 0.2
May 9.1	51.01 .06	52.1 0.5	54.42 .07	42.9 0.2	57.71 .27	32.9 2.1	53.93 .09	12.4 0.2
19.1	50.97 −.02	52.6 0.6	54.37 −.03	43.1 0.2	57.49 .17	30.8 2.3	53.87 −.04	12.2 0.2
29.1	50.97 +.02	53.3 +0.7	54.36 +.02	43.4 +0.3	57.38 −.06	28.4 −2.4	53.85 .00	12.0 −0.1
June 8.0	51.01 .06	54.0 0.8	54.40 .06	43.7 0.4	57.38 +.06	25.9 2.5	53.88 +.05	11.9 0.1
18.0	51.10 .10	54.9 0.9	54.48 .10	44.1 0.4	57.49 .17	23.4 2.5	53.94 .09	11.8 −0.1
28.0	51.22 .14	55.8 0.9	54.60 .14	44.6 0.5	57.72 .27	20.9 2.4	54.06 .13	11.8 0.0
July 8.0	51.38 .17	56.8 1.0	54.75 .17	45.1 0.5	58.04 .37	18.5 2.3	54.20 .17	11.8 0.0
17.9	51.57 +.20	57.8 +1.0	54.94 +.20	45.6 +0.5	58.45 +.46	16.2 −2.2	54.39 +.20	11.8 0.0
27.9	51.78 .23	58.7 0.9	55.15 .23	46.2 0.5	58.95 .54	14.2 1.9	54.60 .23	11.9 +0.1
Aug. 6.9	52.02 .25	59.6 0.8	55.39 .25	46.6 0.5	59.52 .60	12.3 1.7	54.84 .25	12.0 +0.1
16.9	52.28 .26	60.4 0.7	55.65 .26	47.1 0.4	60.16 .66	10.8 1.4	55.10 .27	12.0 0.0
26.8	52.55 .27	61.0 0.6	55.92 .28	47.5 0.3	60.84 .70	9.6 1.1	55.38 .29	12.0 0.0
Sept. 5.8	52.82 +.28	61.5 +0.4	56.20 +.29	47.8 +0.2	61.56 +.74	8.6 −0.7	55.67 +.30	12.0 0.0
15.8	53.11 .29	61.8 +0.1	56.49 .29	47.9 +0.1	62.31 .76	8.1 −0.4	55.97 .31	12.0 −0.1
25.7	53.39 .28	61.9 −0.1	56.79 .30	47.8 −0.1	63.07 .76	7.9 0.0	56.28 .31	11.8 0.2
Oct. 5.7	53.68 .28	61.6 0.3	57.08 .29	47.7 0.3	63.84 .76	8.0 +0.3	56.59 .31	11.6 0.3
15.7	53.96 .27	61.2 0.5	57.38 .29	47.3 0.4	64.59 .75	8.5 0.7	56.90 .31	11.3 0.3
25.7	54.23 +.26	60.6 −0.7	57.66 +.28	46.9 −0.5	65.32 +.71	9.4 +1.1	57.21 +.30	10.9 −0.4
Nov. 4.6	54.48 .25	59.8 0.9	57.93 .26	46.3 0.6	66.02 .66	10.6 1.4	57.50 .29	10.6 0.4
14.6	54.72 .22	58.8 1.0	58.19 .24	45.7 0.7	66.65 .60	12.2 1.7	57.78 .27	10.2 0.4
24.6	54.94 .20	57.8 1.0	58.42 .22	45.0 0.7	67.22 .52	14.1 2.0	58.04 .24	9.8 0.3
Dec. 4.6	55.12 +.17	56.7 −1.1	58.62 +.19	44.3 −0.7	67.70 +.43	16.3 +2.3	58.26 +.21	9.5 −0.3
14.5	55.27 .13	55.7 1.1	58.79 .15	43.7 0.7	68.07 .32	18.7 2.4	58.46 .17	9.2 0.2
24.5	55.37 .09	54.6 1.0	58.91 .10	43.0 0.6	68.34 .20	21.2 2.6	58.60 .13	9.1 −0.2
34.5	55.44 +.04	53.7 −0.9	58.99 +.06	42.5 −0.5	68.48 +.08	23.8 +2.6	58.70 +.09	9.0 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Argus. (*Canopus.*)		γ Geminorum.		α Canis Majoris. (*Sirius.*)		ε Canis Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 6 21	° ′ −52 37	h m 6 30	° ′ +16 29	h m 6 39	° ′ −16 33	h m 6 54	° ′ −28 48
	s	″	s	″	s	″	s	″
(Dec. 30.5)	24.02 +.01	64.6 −3.6	59.49 +.11	43.7 −0.5	61.67 +.09	33.9 −2.5	3.92 +.10	57.7 −3.0
Jan. 9.5	24.00 −.06	68.1 3.4	59.58 .06	43.3 0.4	61.74 +.04	36.3 2.3	3.98 +.04	60.7 2.9
19.4	23.90 .13	71.3 3.1	59.61 +.01	42.9 0.3	61.75 −.01	38.6 2.1	4.00 −.01	63.5 2.7
29.4	23.74 .19	74.3 2.8	59.59 −.04	42.7 0.2	61.72 .06	40.6 1.8	3.96 .06	66.0 2.4
Feb. 8.4	23.52 .25	76.8 2.4	59.53 .09	42.5 0.1	61.64 .10	42.3 1.6	3.87 .11	68.3 2.1
18.4	23.25 −.29	79.0 −1.9	59.42 −.13	42.4 −0.1	61.52 −.14	43.8 −1.3	3.74 −.15	70.2 −1.7
28.3	22.93 .33	80.6 1.4	59.28 .16	42.4 0.0	61.37 .17	44.9 1.0	3.57 .19	71.8 1.3
Mar. 10.3	22.59 .35	81.8 0.9	59.11 .18	42.4 0.0	61.19 .19	45.7 0.6	3.37 .21	72.9 0.9
20.3	22.23 .36	82.4 −0.4	58.93 .19	42.4 0.0	60.99 .20	46.2 −0.3	3.16 .22	73.6 0.5
30.3	21.87 .36	82.4 +0.2	58.74 .18	42.5 0.0	60.80 .20	46.4 0.0	2.93 .22	74.0 −0.1
Apr. 9.2	21.51 −.35	82.0 +0.7	58.56 −.17	42.5 +0.1	60.60 −.19	46.2 +0.3	2.71 −.22	73.9 +0.3
19.2	21.18 .32	81.1 1.2	58.40 .15	42.6 0.1	60.42 .17	45.7 0.6	2.50 .20	73.4 0.7
29.2	20.88 .28	79.7 1.6	58.26 .12	42.6 0.1	60.26 .15	45.0 0.9	2.31 .18	72.5 1.1
May 9.1	20.62 .24	77.8 2.0	58.15 .09	42.7 0.1	60.13 .11	43.9 1.2	2.15 .15	71.3 1.4
19.1	20.41 .19	75.6 2.4	58.08 .05	42.8 0.1	60.04 .08	42.6 1.4	2.02 .12	69.7 1.7
29.1	20.25 −.13	73.0 +2.7	58.05 −.01	43.0 +0.2	59.98 −.04	41.0 +1.6	1.92 −.07	67.8 +2.0
June 8.1	20.16 .07	70.2 3.0	58.06 +.03	43.2 0.2	59.96 .00	39.3 1.8	1.87 −.03	65.7 2.2
18.0	20.12 −.01	67.1 3.1	58.11 .07	43.4 0.3	59.97 +.04	37.4 1.9	1.86 +.01	63.4 2.4
28.0	20.14 +.05	63.9 3.2	58.20 .11	43.7 0.3	60.03 .08	35.4 2.0	1.89 .05	61.0 2.5
July 8.0	20.23 .11	60.7 3.2	58.33 .15	44.0 0.3	60.12 .11	33.4 2.0	1.96 .09	58.4 2.5
18.0	20.37 +.17	57.6 +3.1	58.49 +.18	44.3 +0.3	60.25 +.14	31.4 +2.0	2.07 +.13	55.9 +2.5
27.9	20.57 .22	54.5 2.9	58.68 .21	44.6 0.3	60.41 .17	29.5 1.9	2.22 .16	53.5 2.4
Aug. 6.9	20.82 .27	51.8 2.6	58.90 .23	44.9 0.3	60.60 .20	27.7 1.7	2.40 .19	51.2 2.2
16.9	21.11 .31	49.3 2.2	59.14 .25	45.2 0.2	60.82 .22	26.0 1.5	2.61 .22	49.2 1.9
26.8	21.44 .35	47.3 1.7	59.40 .27	45.3 +0.1	61.05 .24	24.8 1.1	2.84 .25	47.4 1.5
Sept. 5.8	21.80 +.37	45.9 +1.2	59.68 +.28	45.4 0.0	61.30 +.26	23.9 +0.7	3.10 +.27	46.1 +1.1
15.8	22.19 .39	45.0 +0.6	59.96 .29	45.3 −0.1	61.57 .27	23.4 +0.3	3.38 .29	45.2 0.6
25.8	22.59 .40	44.6 0.0	60.26 .30	45.1 0.3	61.85 .28	23.3 −0.1	3.67 .30	44.9 +0.1
Oct. 5.7	22.99 .40	45.0 −0.7	60.55 .30	44.8 0.4	62.14 .29	23.6 0.6	3.98 .31	45.0 −0.4
15.7	23.40 .39	46.0 1.3	60.86 .30	44.3 0.5	62.43 .29	24.4 1.0	4.29 .31	45.8 1.0
25.7	23.78 +.37	47.6 −1.9	61.15 +.29	43.7 −0.6	62.71 +.28	25.6 −1.4	4.59 +.30	47.0 −1.5
Nov. 4.7	24.14 .34	49.7 2.4	61.44 .28	43.1 0.7	62.99 .27	27.2 1.8	4.89 .29	48.7 1.9
14.6	24.47 .30	52.4 2.9	61.72 .27	42.4 0.7	63.26 .25	29.1 2.1	5.18 .27	50.8 2.3
24.6	24.74 .25	55.4 3.2	61.98 .25	41.6 0.7	63.50 .23	31.3 2.3	5.44 .25	53.3 2.6
Dec. 4.6	24.97 +.19	58.8 −3.5	62.21 +.22	40.9 −0.7	63.71 +.20	33.7 −2.4	5.67 +.21	56.1 −2.9
14.5	25.13 .13	62.4 3.6	62.40 .18	40.2 0.6	63.89 .16	36.1 2.5	5.86 .17	59.0 3.0
24.5	25.22 +.06	66.0 3.6	62.56 .13	39.6 0.6	64.03 .12	38.6 2.5	6.01 .12	62.0 3.0
34.5	25.24 −.02	69.5 −3.5	62.67 +.09	39.1 −0.5	64.12 +.07	41.1 −2.4	6.11 +.07	65.0 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Canis Majoris.		δ Geminorum.		Piazzi vii. 67.		α^2 Geminorum. (*Castor.*)	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 3	° ′ −26 12	h m 7 13	° ′ +22 11	h m 7 18	° ′ +68 41	h m 7 27	° ′ +32 8
	s	″	s	″	s	″	s	″
(Dec. 30.5)	40.26 +.11	37.6 −2.9	10.45 +.15	36.7 −0.3	46.85 +.32	56.9 +2.3	10.54 +.19	26.1 +0.2
Jan. 9.5	40.34 +.06	40.5 2.8	10.58 .10	36.5 −0.1	47.10 .19	59.3 2.5	10.70 .13	26.5 0.4
19.5	40.37 .00	43.2 2.6	10.66 +.05	36.4 0.0	47.23 +.06	61.8 2.5	10.80 .07	27.0 0.6
29.4	40.35 −.05	45.7 2.4	10.68 .00	36.5 +0.1	47.23 −.06	64.3 2.5	10.84 +.01	27.6 0.7
Feb. 8.4	40.28 .10	47.9 2.1	10.65 −.05	36.7 0.2	47.10 .19	66.8 2.3	10.82 −.05	28.4 0.8
18.4	40.16 −.14	49.8 −1.7	10.58 −.10	36.9 +0.3	46.86 −.30	69.0 +2.1	10.75 −.10	29.1 +0.8
28.4	40.00 .17	51.3 1.4	10.46 .14	37.2 0.3	46.51 .39	71.0 1.8	10.63 .14	29.9 0.7
Mar. 10.3	39.81 .20	52.5 1.0	10.30 .16	37.5 0.3	46.08 .46	72.5 1.4	10.48 .17	30.6 0.6
20.3	39.61 .21	53.3 0.6	10.13 .18	37.8 0.3	45.59 .51	73.7 0.9	10.29 .20	31.2 0.5
30.3	39.39 .21	53.6 −0.2	9.94 .19	38.0 0.2	45.07 .53	74.4 +0.4	10.09 .21	31.6 0.4
Apr. 9.3	39.18 −.21	53.6 +0.2	9.75 −.18	38.2 +0.2	44.54 −.53	74.6 0.0	9.88 −.20	31.9 +0.2
19.2	38.97 .20	53.2 0.6	9.58 .17	38.3 +0.1	44.02 .50	74.3 −0.5	9.68 .19	32.0 0.0
29.2	38.79 .17	52.5 0.9	9.42 .15	38.4 0.0	43.54 .45	73.6 1.0	9.50 .17	32.0 −0.1
May 9.2	38.63 .14	51.3 1.3	9.28 .12	38.4 0.0	43.11 .39	72.4 1.4	9.34 .14	31.8 0.3
19.1	38.50 .11	49.9 1.6	9.18 .08	38.4 −0.1	42.76 .31	70.8 1.7	9.22 .10	31.4 0.4
29.1	38.41 −.07	48.2 +1.9	9.12 −.04	38.3 −0.1	42.50 −.22	68.9 −2.1	9.14 −.06	31.0 −0.5
June 8.1	38.35 −.04	46.2 2.1	9.09 .00	38.2 0.1	42.33 .12	66.7 2.3	9.09 −.02	30.4 0.6
18.1	38.34 .00	44.0 2.3	9.11 +.03	38.1 0.1	42.26 −.02	64.3 2.5	9.09 +.02	29.8 0.7
28.0	38.36 +.04	41.7 2.4	9.16 .07	37.9 0.1	42.29 +.08	61.7 2.6	9.14 .06	29.1 0.7
July 8.0	38.43 .08	39.3 2.4	9.25 .11	37.8 0.1	42.42 .18	59.1 2.6	9.22 .10	28.3 0.8
18.0	38.53 +.12	36.9 +2.4	9.38 +.14	37.7 −0.2	42.64 +.27	56.5 −2.6	9.34 +.14	27.6 −0.8
28.0	38.66 .15	34.5 2.3	9.54 .18	37.5 0 2	42.96 .36	54.0 2.5	9.50 .17	26.8 0.8
Aug. 6.9	38.83 .18	32.3 2.1	9.73 .20	37.3 0.2	43.36 .44	51.5 2.4	9.68 .21	26.0 0.8
16.9	39.03 .21	30.4 1.8	9.94 .23	37.0 0.3	43.83 .51	49.2 2.2	9.90 .23	25.1 0.8
26.9	39.26 .24	28.7 1.5	10.18 .25	36.8 0.3	44.38 .57	47.0 2.0	10.15 .26	24.3 0.8
Sept. 5.8	39.51 +.26	27.4 +1.1	10.44 +.27	36.4 −0.4	44.98 +.63	45.2 −1.8	10.42 +.28	23.4 −0.9
15.8	39.78 .28	26.6 0.6	10.72 .28	35.9 0.5	45.63 .67	43.6 1.5	10 72 .30	22.6 0.9
25.8	40.06 .29	26.2 +0.1	11.01 .30	35.4 0.6	46.33 .71	42.2 1.2	11.03 .32	21.7 0.9
Oct. 5.8	40.36 .30	26.3 −0.4	11.32 .31	34.7 0.7	47.05 .73	41.2 0.8	11.36 .33	20.9 0.8
15.7	40.66 .30	27.0 0.9	11.63 .32	34.0 0.7	47.79 .75	40.6 −0.4	11.70 .34	20.1 0.8
25.7	40.97 +.30	28.1 −1.4	11.95 +.32	33.3 −0.8	48.54 +.74	40 4 0.0	12.04 +.35	19.3 −0.7
Nov. 4.7	41.27 .29	29.7 1.8	12.26 .31	32.5 0.8	49.28 .73	40.6 +0.4	12.39 .35	18.6 0.6
14.7	41.56 .28	31.8 2.2	12.57 .30	31.7 0.8	49.99 .69	41.2 0.8	12.73 .34	18.0 0.5
24.6	41.82 .25	34.2 2.5	12.87 .28	31.0 0.7	50.66 .64	42.2 1.2	13.06 .32	17.6 0.4
Dec. 4.6	42.06 +.22	36.8 −2.8	13.14 +.26	30.3 −0.6	51.28 +.57	43.6 +1.6	13.37 +.29	17.3 −0.2
14.6	42.26 .18	39.7 2.9	13.38 .22	29.8 0.5	51.81 .49	45.3 1.9	13.64 .26	17.2 0.0
24.5	42.42 .14	42.6 2.9	13.59 .18	29.3 0.4	52.25 .38	47.4 2.2	13.88 .21	17.3 +0.2
34.5	42.53 +.09	45.5 −2.9	13.75 +.13	29.1 −0.2	52.57 +.27	49.7 +2.4	14.06 +.15	17.6 +0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canis Minoris. (*Procyon.*)		β Geminorum. (*Pollux.*)		φ Geminorum.		3 Ursæ Majoris (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	7h 33m	+ 5° 31′	7h 38m	+28° 18′	7h 46m	+27° 3′	8h 1m	+68° 48′
	s	″	s	″	s	″	s	″
(Dec. 30.5)	12.74 +.16	16.5 −1.4	11.72 +.19	15.1 0.0	22.49 +.19	50.5 −0.1	13.99 +.42	43.6 +2.0
Jan. 9.5	12.88 .11	15.2 1.3	11.88 .13	15.2 +0.2	22.66 .14	50.4 +0.1	14.35 .30	45.8 2.3
19.5	12.97 .06	14.0 1.1	11.99 .08	15.5 0.3	22.78 .09	50.6 0.3	14.59 .17	48.2 2.5
29.5	13.00 +.01	13.0 0.9	12.04 +.02	15.9 0.5	22.84 +.03	50.9 0.4	14.70 +.04	50.8 2.6
Feb. 8.4	12.99 −.04	12.2 0.7	12.03 −.03	16.4 0.6	22.84 −.02	51.4 0.5	14.67 −.09	53.4 2.5
18.4	12.93 −.08	11.6 −0.5	11.97 −.08	17.0 +0.6	22.79 −.07	52.0 +0.6	14.53 −.21	55.8 +2.4
28.4	12.83 .12	11.1 0.4	11.86 .13	17.6 0.6	22.70 .12	52.5 0.6	14.26 .31	58.1 2.2
Mar. 10.3	12.69 .15	10.8 0.2	11.72 .16	18.2 0.6	22.56 .15	53.1 0.6	13.90 .40	60.1 1.8
20.3	12.54 .17	10.7 −0.1	11.54 .18	18.8 0.5	22.40 .18	53.7 0.5	13.47 .47	61.8 1.4
30.3	12.36 .17	10.7 0.0	11.35 .19	19.2 0.4	22.21 .19	54.2 0.4	12.97 .51	63.0 1.0
Apr. 9.3	12.19 −.17	10.8 +0.2	11.16 −.20	19.6 +0.3	22.02 −.19	54.5 +0.3	12.45 −.53	63.7 +0.5
19.2	12.02 .16	11.0 0.3	10.96 .19	19.8 +0.2	21.83 .18	54.8 0.2	11.92 .52	64.0 0.0
29.2	11.86 .15	11.3 0.4	10.79 .17	19.9 0.0	21.66 .16	54.9 +0.1	11.42 .49	63.8 −0.5
May 9.2	11.73 .12	11.7 0.4	10.64 .14	19.8 −0.1	21.50 .14	55.0 0.0	10.94 .45	63.0 0.9
19.2	11.62 .09	12.2 0.5	10.51 .11	19.7 0.2	21.38 .11	54.9 −0.1	10.53 .38	61.9 1.4
29.1	11.55 −.06	12.8 +0.6	10.42 −.07	19.4 −0.3	21.29 −.07	54.7 −0.2	10.18 −.30	60.3 −1.7
June 8.1	11.50 −.03	13.4 0.7	10.37 −.03	19.0 0.4	21.23 −.04	54.4 0.3	9.92 .22	58.4 2.1
18.1	11.50 +.01	14.1 0.7	10.36 +.01	18.6 0.5	21.22 .00	54.0 0.4	9.75 .13	56.2 2.3
28.0	11.52 .04	14.8 0.7	10.39 .05	18.1 0.5	21.24 +.04	53.6 0.4	9.67 −.03	53.8 2.5
July 8.0	11.58 .08	15.6 0.7	10.46 .09	17.6 0.6	21.30 .08	53.2 0.5	9.69 +.07	51.2 2.7
18.0	11.68 +.11	16.3 +0.7	10.57 +.12	17.0 −0.6	21.40 +.11	52.6 −0.5	9.81 +.16	48.5 −2.7
28.0	11.80 .14	17.0 0.7	10.71 .16	16.4 0.6	21.53 .15	52.1 0.6	10.01 .25	45.7 2.7
Aug. 6.9	11.96 .17	17.7 0.6	10.88 .19	15.7 0.7	21.69 .18	51.5 0.6	10.30 .34	43.0 2.7
16.9	12.13 .19	18.2 0.4	11.08 .21	15.0 0.7	21.88 .21	50.8 0.7	10.68 .42	40.3 2.6
26.9	12.34 .21	18.5 0.3	11.31 .24	14.3 0.8	22.10 .23	50.1 0.8	11.13 .49	37.8 2.5
Sept. 5.9	12.56 +.23	18.7 +0.1	11.56 +.26	13.6 −0.8	22.35 +.26	49.3 −0.8	11.65 +.55	35.4 −2.3
15.8	12.80 .25	18.6 −0.2	11.84 .29	12.7 0.8	22.62 .28	48.5 0.9	12.24 .61	33.2 2.0
25.8	13.07 .27	18.3 0.4	12.13 .30	11.9 0.9	22.90 .30	47.6 0.9	12.87 .66	31.4 1.7
Oct. 5.8	13.34 .28	17.8 0.7	12.44 .32	11.0 0.9	23.21 .31	46.6 0.9	13.56 .70	29.8 1.4
15.7	13.63 .29	17.0 0.9	12.77 .33	10.1 0.9	23.53 .32	45.7 1.0	14.28 .73	28.5 1.1
25.7	13.92 +.30	16.0 −1.1	13.10 +.33	9.2 −0.9	23.86 +.33	44.7 −1.0	15.02 +.75	27.6 −0.7
Nov. 4.7	14.22 .30	14.8 1.3	13.44 .33	8.3 0.8	24.20 .34	43.8 0.9	15.77 .75	27.2 −0.2
14.7	14.52 .29	13.4 1.4	13.77 .33	7.5 0.7	24.53 .33	42.9 0.8	16.51 .73	27.2 +0.2
24.6	14.80 .27	12.0 1.5	14.09 .31	6.8 0.6	24.85 .32	42.1 0.7	17.23 .70	27.6 0.6
Dec. 4.6	15.06 +.25	10.4 −1.5	14.39 +.29	6.3 −0.5	25.16 +.29	41.4 −0.6	17.91 +.64	28.4 +1.1
14.6	15.30 .22	8.9 1.5	14.67 .26	5.9 0.3	25.44 .26	40.9 0.4	18.52 .57	29.8 1.5
24.6	15.50 .18	7.4 1.4	14.90 .21	5.7 −0.1	25.68 .22	40.6 −0.2	19.05 .48	31.4 1.9
34.5	15.66 +.14	6.0 −1.3	15.10 +.17	5.7 +0.1	25.88 +.18	40.5 0.0	19.48 +.37	33.5 +2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	15 Argus (ι)		η Cancri.		ε Hydræ.		ι Ursæ Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 8 2	−23° 58′	h m 8 25	+20° 49′	h m 8 40	+ 6° 50′	h m 8 51	+48° 29′
	s	″	s	″	s	″	s	″
(Dec. 30.6)	35.85 +.17	10.6 −2.9	58.66 +.23	62.2 −0.6	36.78 +.22	38.7 −1.5	14.00 +.32	42.0 +0.7
Jan. 9.5	36.00 .12	13.5 2.9	58.86 .18	61.7 0.4	36.98 .18	37.3 1.3	14.29 .26	42.9 1.0
19.5	36.10 .07	16.4 2.7	59.01 .13	61.3 −0.2	37.13 .13	36.0 1.1	14.52 .19	44.1 1.3
29.5	36.14 +.02	19.0 2.5	59.11 .07	61.2 0.0	37.24 .08	35.0 0.9	14.67 .12	45.5 1.6
Feb. 8.5	36.13 −.04	21.4 2.3	59.15 +.02	61.2 +0.1	37.29 +.03	34.1 0.7	14.76 +.05	47.2 1.7
18.4	36.07 −.08	23.5 −2.0	59.14 −.03	61.5 +0.3	37.29 −.02	33.5 −0.5	14.77 −.03	49.0 +1.8
28.4	35.97 .12	25.4 1.7	59.08 .08	61.8 0.4	37.25 .06	33.1 0.3	14.71 .09	50.7 1.8
Mar. 10.4	35.83 .15	26.9 1.3	58.99 .12	62.3 0.5	37.16 .10	32.9 −0.1	14.58 .15	52.5 1.7
20.4	35.66 .18	28.0 0.9	58.85 .15	62.8 0.5	37.05 .13	32.8 0.0	14.41 .20	54.1 1.5
30.3	35.47 .19	28.7 0.6	58.70 .17	63.3 0.5	36.90 .15	32.9 +0.1	14.19 .23	55.5 1.3
Apr. 9.3	35.27 −.20	29.1 −0.2	58.52 −.17	63.7 +0.5	36.75 −.16	33.1 +0.3	13.95 −.25	56.6 +1.0
19.3	35.08 .19	29.2 +0.1	58.35 .17	64.2 0.4	36.59 .16	33.4 0.3	13.70 .26	57.5 0.7
29.3	34.89 .18	28.8 0.5	58.18 .16	64.5 0.3	36.44 .15	33.8 0.4	13.44 .25	58.0 +0.3
May 9.2	34.72 .16	28.2 0.8	58.03 .14	64.8 0.3	36.29 .14	34.2 0.5	13.20 .23	58.2 0.0
19.2	34.57 .14	27.2 1.2	57.90 .12	65.1 0.2	36.16 .12	34.7 0.5	12.98 .21	58.0 −0.3
29.2	34.45 −.11	25.9 +1.4	57.79 −.09	65.2 +0.1	36.05 −.09	35.2 +0.5	12.78 −.18	57.5 −0.7
June 8.1	34.36 .07	24.3 1.7	57.71 .06	65.3 0.0	35.97 .07	35.8 0.6	12.63 .14	56.7 1.0
18.1	34.30 .04	22.5 1.9	57.66 −.03	65.3 0.0	35.92 .04	36.4 0.6	12.51 .09	55.6 1.2
28.1	34.28 −.01	20.5 2.0	57.65 .00	65.2 −0.1	35.89 −.01	37.0 0.6	12.44 −.05	54.2 1.5
July 8.1	34.29 +.03	18.4 2.1	57.67 +.04	65.0 0.2	35.90 +.02	37.5 0.6	12.42 .00	52.6 1.7
18.0	34.33 +.06	16.3 +2.2	57.73 +.07	64.8 −0.3	35.93 +.05	38.1 +0.5	12.44 +.04	50.9 −1.8
28.0	34.41 .10	14.1 2.1	57.81 .10	64.5 0.3	35.99 .08	38.6 0.5	12.50 .09	49.0 2.0
Aug. 7.0	34.52 .13	12.0 2.0	57.93 .13	64.1 0.4	36.09 .11	39.0 0.4	12.62 .13	47.0 2.1
17.0	34.67 .16	10.1 1.8	58.07 .16	63.7 0.5	36.20 .13	39.3 +0.2	12.77 .18	44.9 2.1
26.9	34.84 .19	8.4 1.5	58.24 .19	63.1 0.6	36.35 .16	39.4 0.0	12.96 .22	42.8 2.1
Sept. 5.9	35.05 +.22	7.0 +1.2	58.44 +.21	62.4 −0.8	36.52 +.19	39.4 −0.1	13.20 +.26	40.6 −2.1
15.9	35.28 .24	6.0 0.8	58.67 .24	61.6 0.9	36.72 .21	39.1 0.4	13.48 .30	38.5 2.1
25.8	35.53 .27	5.4 +0.4	58.92 .26	60.6 1.0	36.95 .24	38.7 0.6	13.79 .33	36.5 2.0
Oct. 5.8	35.81 .29	5.3 −0.1	59.19 .28	59.5 1.1	37.20 .26	38.0 0.8	14.14 .36	34.5 1.9
15.8	36.11 .30	5.6 0.6	59.49 .30	58.4 1.2	37.47 .28	37.0 1.1	14.52 .39	32.7 1.7
25.8	36.41 +.31	6.5 −1.1	59.80 +.32	57.1 −1.3	37.76 +.30	35.8 −1.3	14.93 +.42	31.1 −1.5
Nov. 4.7	36.72 .31	7.8 1.6	60.12 .32	55.8 1.3	38.06 .31	34.5 1.4	15.35 .43	29.7 1.3
14.7	37.04 .31	9.6 2.0	60.45 .33	54.5 1.3	38.37 .31	33.0 1.6	15.79 .44	28.6 1.0
24.7	37.34 .29	11.8 2.3	60.77 .32	53.3 1.2	38.68 .31	31.3 1.7	16.23 .44	27.8 0.6
Dec. 4.7	37.62 +.27	14.2 −2.6	61.08 +.30	52.1 −1.1	38.98 +.29	29.6 −1.7	16.66 +.42	27.3 −0.3
14.6	37.87 .24	16.9 2.8	61.38 .28	51.1 1.0	39.26 .27	27.9 1.7	17.07 .39	27.2 +0.1
24.6	38.09 .20	19.8 2.9	61.64 .25	50.2 0.8	39.52 .24	26.3 1.6	17.44 .35	27.5 0.5
34.6	38.26 +.15	22.7 −2.9	61.87 +.20	49.5 −0.6	39.74 +.20	24.8 −1.4	17.77 +.30	28.2 +0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ² Ursæ Majoris.		κ Cancri.		ι Argus.		1 Draconis (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 9 0	° ′ +67 35	h m 9 1	° ′ +11 7	h m 9 13	° ′ −58 47	h m 9 20	° ′ +81 49
	s	″	s	″	s	″	s	″
(Dec. 30.6)	8.54 +.52	69.4 +1.5	26.52 +.24	65.7 −1.4	60.37 +.32	1.6 −3.5	25.83+1.31	68.0 +1.8
Jan. 9.6	9.01 .42	71.1 1.9	26.74 .20	64.4 1.2	60.65 .24	5.2 3.7	27.03 1.07	70.1 2.2
19.6	9.37 .31	73.2 2.2	26.91 .15	63.4 0.9	60.85 .16	9.0 3.8	27.97 .80	72.5 2.6
29.5	9.62 .19	75.6 2.5	27.04 .10	62.5 0.7	60.98 +.08	12.8 3.8	28.63 .51	75.3 2.9
Feb. 8.5	9.75 +.06	78.1 2.6	27.12 +.05	61.9 0.5	61.01 .00	16.6 3.7	28.98 +.20	78.3 3.0
18.5	9.75 −.06	80.7 +2.6	27.14 .00	61.6 −0.3	60.97 −.08	20.2 −3.5	29.01 −.12	81.3 +3.0
28.4	9.63 .17	83.3 2.5	27.12 −.06	61.4 −0.1	60.85 .15	23.7 3.3	28.74 .42	84.3 2.9
Mar. 10.4	9.41 .27	85.7 2.3	27.05 .08	61.4 +0.1	60.66 .22	26.8 2.9	28.17 .70	87.1 2.7
20.4	9.10 .35	87.9 2.0	26.95 .11	61.6 0.2	60.42 .27	29.5 2.5	27.35 .94	89.7 2.4
30.4	8.70 .42	89.8 1.7	26.82 .14	61.8 0.3	60.12 .31	31.8 2.1	26.31 1.13	91.9 2.0
Apr. 9.3	8.26 −.46	91.2 +1.2	26.67 −.15	62.2 +0.4	59.80 −.34	33.7 −1.6	25.09−1.28	93.6 +1.5
19.3	7.78 .48	92.2 0.8	26.52 .16	62.6 0.4	59.44 .36	35.1 1.1	23.77 1.37	94.8 0.9
29.3	7.30 .48	92.7 +0.3	26.37 .15	63.0 0.5	59.08 .36	36.0 0.6	22.37 1.40	95.5 +0.4
May 9.3	6.83 .46	92.7 −0.2	26.22 .14	63.5 0.5	58.72 .36	36.3 −0.1	20.97 1.39	95.6 −0.2
19.2	6.38 .43	92.3 0.7	26.09 .12	63.9 0.5	58.36 .35	36.2 +0.4	19.61 1.32	95.1 0.8
29.2	5.98 −.37	91.4 −1.1	25.97 −.10	64.4 +0.5	58.03 −.32	35.5 +0.9	18.34−1.22	94.0 −1.3
June 8.2	5.63 .31	90.0 1.6	25.88 .08	64.8 0.4	57.71 .29	34.4 1.4	17.19 1.07	92.5 1.8
18.1	5.36 .24	88.3 1.9	25.82 .05	65.3 0.4	57.44 .26	32.8 1.8	16.20 .90	90.5 2.2
28.1	5.16 .16	86.2 2.2	25.78 −.03	65.6 0.4	57.21 .21	30.8 2.2	15.39 .71	88.1 2.6
July 8.1	5.04 −.08	83.8 2.5	25.76 .00	66.0 0.3	57.02 .16	28.4 2.5	14.79 .49	85.4 2.9
18.1	5.00 .00	81.2 −2.7	25.78 +.03	66.3 +0.3	56.89 − 10	25.7 +2.8	14.41 −.27	82.4 −3.1
28.0	5.04 +.09	78.4 2.8	25.83 .06	66.5 0.2	56.82 −.04	22.8 2.9	14.26 −.04	79.1 3.3
Aug. 7.0	5.17 .17	75.6 2.9	25.90 .09	66.6 +0.1	56.80 +.02	19.8 3.0	14.33 +.19	75.8 3.4
17.0	5.38 .25	72.6 2.9	26.00 .12	66.6 −0.1	56.86 .09	16.8 3.0	14.64 .42	72.4 3.4
27.0	5.66 .32	69.7 2.9	26.13 .14	66.4 0.2	56.97 .15	13.9 2.9	15.17 .64	69.0 3.4
Sept. 5.9	6.03 +.40	66.8 −2.8	26.29 +.17	66.1 −0.4	57.16 +.22	11.2 +2.6	15.92 +.85	65.7 −3.3
15.9	6.46 .47	64.1 2.7	26.48 .20	65.6 0.6	57.42 .28	8.7 2.2	16.87 1.05	62.5 3.1
25.9	6.96 .53	61.5 2.5	26.69 .23	64.9 0.8	57.73 .34	6.7 1.8	18.01 1.23	59.5 2.8
Oct. 5.8	7.52 .59	59.2 2.2	26:93 .25	64.0 1.0	58.10 .40	5.2 1.4	19.33 1.39	56.8 2.5
15.8	8.14 .64	57.1 1.9	27.19 .27	62.9 1.2	58.53 .44	4.2 +0.7	20.80 1.54	54.5 2.2
25.8	8.79 +.68	55.4 −1.6	27.48 +.29	61.6 −1.4	58.99 +.47	3.8 0.0	22.39+1.65	52.5 −1.7
Nov. 4.8	9.48 .70	54.0 1.2	27.78 .31	60.1 1.5	59.48 .49	4.0 −0.6	24.08 1.72	51.0 1.2
14.7	10.19 .71	53.0 0.7	28.10 .32	58.6 1.6	59.98 .50	5.0 1.2	25.83 1.76	50.0 0.7
24.7	10.90 .70	52.6 −0.2	28.41 .32	56.9 1.6	60.47 .49	6.5 1.8	27.59 1.75	49.6 −0.2
Dec. 4.7	11.60 +.68	52.6 +0.3	28.73 +.31	55.3 −1.6	60.95 +.46	8.7 −2.4	29.32+1.70	49.7 +0.4
14.7	12.26 .63	53.2 0.8	29.03 .29	53.7 1.6	61.38 .41	11.3 2.9	30.97 1.59	50.4 1.0
24.6	12.85 .56	54.2 1.3	29 30 .26	52.2 1.4	61.77 .36	14.4 3.3	32.49 1.43	51.7 1 5
34.6	13.38 +.48	55.7 +1.7	29.55 +.23	50.8 −1.2	62.10 +.29	17.9 −3.6	33.82+1.23	53.5 +2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Hydræ.		d Ursæ Majoris.		θ Ursæ Majoris.		ε Leonis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$9^{h}\ 21^{m}$	$-8^{\circ}\ 9'$	$9^{h}\ 24^{m}$	$+70^{\circ}\ 19'$	$9^{h}\ 25^{m}$	$+52^{\circ}\ 11'$	$9^{h}\ 39^{m}$	$+24^{\circ}\ 18'$
	s	″	s	″	s	″	s	″
(Dec. 30.6)	52.14 +.25	15.5 −2.3	10.35 +.59	74.4 +1.3	3.79 +.38	74.7 +0.6	14.31 +.28	28.8 −0.9
Jan. 9.6	52.37 .21	17.8 2.2	10.92 .51	76.0 1.8	4.14 .32	75.5 1.0	14.57 .25	28.0 0.6
19.6	52.55 .16	19.9 2.1	11.37 .40	78.1 2.2	4.43 .25	76.7 1.3	14.80 .20	27.6 −0.3
29.5	52.69 .11	21.9 1.9	11.70 .27	80.4 2.5	4.64 .18	78.2 1.6	14.98 .15	27.4 0.0
Feb. 8.5	52.77 .06	23.7 1.7	11.90 +.13	83.0 2.7	4.78 .10	80.0 1.9	15.10 .10	27.6 +0.3
18.5	52.81 +.01	25.3 −1.4	11.96 −.01	85.8 +2.7	4.83 +.02	81.9 +2.0	15.17 +.04	28.0 +0.5
28.4	52.80 −.03	26.6 1.2	11.89 .14	88.5 2.7	4.82 −.05	84.0 2.1	15.18 −.01	28.6 0.7
Mar. 10.4	52.75 .07	27.7 0.9	11.69 .26	91.1 2.5	4.72 .12	86.0 2.0	15.15 .06	29.3 0.8
20.4	52.66 .10	28.5 0.7	11.38 .36	93.6 2.3	4.57 .18	88.0 1.9	15.07 .09	30.2 0.9
30.4	52.54 .13	29.0 0.4	10.97 .44	95.7 1.9	4.37 .22	89.7 1.6	14.96 .12	31.1 0.9
Apr. 9.3	52.41 −.14	29.3 −0.2	10.50 −.50	97.4 +1.5	4.13 −.25	91.2 +1.4	14.82 −.14	32.0 +0.9
19.3	52.26 .15	29.4 0.0	9.98 .54	98.7 1.1	3.86 .27	92.4 1.0	14.67 .16	32.8 0.8
29.3	52.11 .15	29.3 +0.2	9.43 .55	99.5 +0.5	3.58 .27	93.3 0.7	14.51 .16	33.6 0.7
May 9.3	51.97 .14	28.9 0.4	8.88 .54	99.8 0.0	3.31 .27	93.8 +0.3	14.36 .16	34.2 0.6
19.2	51.83 .13	28.4 0.6	8.35 .51	99.6 −0.5	3.06 .25	93.8 −0.1	14.20 .14	34.7 0.4
29.2	51.71 −.11	27.7 +0.8	7.86 −.47	98.9 −0.9	2.82 −.22	93.6 −0.5	14.07 −.13	35.1 +0.3
June 8.2	51.60 .09	26.8 0.9	7.42 .41	97.7 1.4	2.61 .19	92.9 0.8	13.95 .11	35.3 +0.1
18.1	51.52 .07	25 8 1.1	7.05 .33	90.1 1.8	2.45 .15	91.9 1 2	13.86 .08	35.3 0.0
28.1	51.46 .05	24.7 1.1	6.75 .25	94.1 2.2	2.32 .10	90.5 1.5	13.78 .06	35.2 −0.2
July 8.1	51.42 −.02	23.6 1.2	6.54 .17	91.8 2.5	2.24 .06	88.9 1.7	13.74 −.03	35.0 0.3
18.1	51.42 .00	22.4 +1.2	6.42 −.08	89.1 −2.7	2.20 −.01	87.0 −2.0	13.72 .00	34.6 −0.5
28.0	51.43 +.03	21.1 1.2	6.39 +.02	86.3 2.9	2.22 +.03	85.0 2.2	13.74 +.03	34.0 0.6
Aug. 7.0	51.48 .06	20.0 1.1	6.46 .11	83.3 3.0	2.27 .08	82.7 2.3	13.78 .06	33.3 0.8
17.0	51.55 .09	18.9 1.0	6.61 .20	80.2 3.1	2.38 .13	80.4 2.4	13.85 .09	32.4 0.9
27.0	51.65 .12	18.0 0.8	6.86 .29	77.1 3.1	2.53 .18	77.9 2.5	13.95 .12	31.4 1.1
Sept. 5.9	51.78 +.15	17.3 +0.6	7.19 +.38	74.0 −3.1	2.73 +.22	75.4 −2.5	14.08 +.15	30.3 −1.2
15.9	51.94 .18	16.8 +0.3	7.60 .46	71.0 2.9	2.98 .27	72.9 2.5	14.24 .18	29.0 1.4
25.9	52.14 .21	16.7 0.0	8.11 .54	68.1 2.8	3.27 .31	70.5 2.4	14.44 .21	27.5 1.5
Oct. 5.8	52.36 .24	16.8 −0.4	8.68 .61	65.5 2.5	3.60 .35	68.1 2.3	14.66 .24	26.0 1.6
15.8	52.61 .26	17.4 0.7	9.32 .67	63.1 2.2	3.97 .39	65.9 2.1	14.92 .27	24.3 1.7
25.8	52.88 +.28	18.2 −1.0	10.02 +.72	61.0 −1.9	4.38 +.42	63.8 −1.9	15.20 +.30	22.6 −1.7
Nov. 4.8	53.17 .30	19.5 1.4	10.77 .76	59.4 1.4	4.81 .45	62.0 1.6	15.51 .32	20.8 1.8
14.7	53.48 .31	21.0 1.7	11.55 .79	58.1 1.0	5.27 .46	60.5 1.3	15.84 .33	19.0 1.7
24.7	53.79 .31	22.8 1.9	12.34 .79	57.4 −0.5	5.74 .47	59.4 1.0	16.18 .34	17.4 1.6
Dec. 4.7	54.10 +.31	24.9 −2.1	13.12 +.77	57.2 0.0	6.21 +.46	58.6 −0.5	16.52 +.34	15.8 −1.5
14.7	54.40 .29	27.1 2.2	13.88 .73	57.5 +0.6	6.66 .44	58.3 −0.1	16.86 .33	14.4 1.3
24.6	54.68 .26	29.4 2.3	14.58 .66	58.3 1.1	7.08 .40	58.4 +0.3	17.18 .31	13.3 1.0
34.6	54.93 +.23	31.6 −2.2	15.20 +.58	59.6 +1.5	7.46 +.36	59.0 +0.8	17.47 +.27	12.4 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Leonis.		α Leonis. (*Regulus.*)		32 Ursæ Majoris.		γ¹ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 9 46	° ′ +26 32	h m 10 2	° ′ +12 31	h m 10 9	° ′ +65 40	h m 10 13	° ′ +20 25
	s	″	s	″	s	″	s	″
(Dec. 30.6)	8.24 +.30	70.4 −0.8	10.06 +.29	65.9 −1.5	33.75 +.57	65.0 +0.7	32.84 +.30	43.5 −1.2
Jan. 9.6	8.51 .26	69.7 0.5	10.32 .25	64.5 1.3	34.30 .51	66.0 1.2	33.12 .27	42.4 1.0
19.6	8.75 .21	69.4 −0.2	10.56 .21	63.3 1.0	34.76 .42	67.4 1.7	33.37 .23	41.6 0.7
29.6	8.93 .16	69.3 +0.1	10.74 .16	62.4 0.8	35.14 .31	69.3 2.1	33.58 .18	41.1 −0.4
Feb. 8.5	9.06 .10	69.6 0.4	10.88 .11	61.8 0.5	35.41 .22	71.5 2.4	33.73 .13	40.9 0.0
18.5	9.14 +.05	70.1 +0.6	10.96 +.06	61.4 −0.2	35.58 +.11	74.0 +2.6	33.83 +.08	41.0 +0.2
28.5	9.16 .00	70.8 0.8	11.00 +.01	61.3 0.0	35.63 .00	76.7 2.7	33.88 +.03	41.3 0.5
Mar. 10.5	9.13 −.05	71.6 0.9	10.99 −.03	61.4 +0.2	35.57 −.11	79.3 2.6	33.88 −.02	41.9 0.6
20.4	9.06 .09	72.7 1.0	10.94 .07	61.6 0.4	35.41 .20	81.9 2.5	33.84 .05	42.6 0.8
30.4	8.95 .12	73.8 1.0	10.86 .10	62.1 0.5	35.17 .28	84.3 2.3	33.77 .09	43.4 0.9
Apr. 9.4	8.82 −.14	74.7 +1.0	10.75 −.12	62.6 +0.6	34.86 −.34	86.5 +2.0	33.66 −.12	44.3 +0.9
19.3	8.66 .16	75.7 0.9	10.62 .13	63.2 0.6	34.49 .39	88.3 1.6	33.54 .13	45.2 0.9
29.3	8.50 .16	76.5 0.8	10.48 .14	63.8 0.6	34.08 .42	89.7 1.1	33.40 .14	46.0 0.8
May 9.3	8.34 .16	77.2 0.6	10.35 .14	64.4 0.6	33.66 .43	90.6 0.7	33.26 .14	46.8 0.7
19.3	8.19 .15	77.7 0.4	10.21 .13	65.0 0.6	33.23 .42	91.0 +0.2	33.11 .14	47.5 0.6
29.2	8.05 −.13	78.1 +0.3	10.08 −.12	65.6 +0.5	32.82 −.40	90.9 −0.3	32.98 −.13	48.0 +0.5
June 8.2	7.92 .11	78.3 +0.1	9.97 .10	66.1 0.5	32.43 .37	90.4 0.8	32.86 .11	48.5 0.3
18.2	7.82 .09	78.3 −0.1	9.88 .09	66.5 0.4	32.09 .32	89.4 1.2	32.75 .10	48.7 0.2
28.2	7.74 .06	78.1 0.3	9.80 .07	66.9 0.3	31.79 .27	87.9 1.6	32.67 .08	48.9 +0.1
July 8.1	7.69 .04	77.8 0.4	9.74 .05	67.2 0.2	31.55 .21	86.1 2.0	32.60 .06	48.9 −0.1
18.1	7.67 −.01	77.2 −0.6	9.71 −.02	67.4 +0.1	31.36 −.15	83.9 −2.4	32.56 −.03	48.7 −0.3
28.1	7.67 +.02	76.6 0.8	9.70 .00	67.4 0.0	31.25 .08	81.4 2.6	32.54 −.01	48.4 0.4
Aug. 7.0	7.70 .05	75.7 0.9	9.72 +.03	67.4 −0.1	31.20 −.01	78.6 2.9	32.54 +.02	47.9 0.6
17.0	7.77 .08	74.7 1.1	9.76 .06	67.2 0.3	31.22 +.06	75.7 3.0	32.58 .05	47.2 0.8
27.0	7.86 .11	73.6 1.2	9.83 .09	66.9 0.4	31.32 .13	72.6 3.1	32.64 .08	46.4 0.9
Sept. 6.0	7.99 +.14	72.3 −1.4	9.93 +.12	66.4 −0.6	31.48 +.20	69.4 −3.2	32.73 +.11	45.3 −1.1
15.9	8.14 .17	70.8 1.5	10.06 .15	65.6 0.8	31.72 .28	66.2 3.2	32.85 .14	44.1 1.3
25.9	8.34 .21	69.2 1.6	10.22 .18	64.7 1.0	32.04 .35	63.1 3.1	33.01 .17	42.8 1.5
Oct. 5.9	8.56 .24	67.6 1.7	10.41 .21	63.6 1.2	32.42 .42	60.1 3.0	33.20 .21	41.2 1.6
15.9	8.81 .27	65.8 1.8	10.64 .24	62.2 1.4	32.87 .48	57.2 2.7	33.43 .24	39.6 1.7
25.8	9.10 +.30	64.0 −1.8	10.89 +.27	60.7 −1.6	33.39 +.54	54.6 −2.5	33.68 +.27	37.8 −1.8
Nov. 4.8	9.41 .33	62.1 1.8	11.18 .29	59.0 1.7	33.96 .59	52.3 2.1	33.97 .30	35.8 1.9
14.8	9.74 .34	60.3 1.8	11.48 .31	57.2 1.8	34.57 .63	50.4 1.7	34.28 .32	33.9 1.9
24.7	10.08 .35	58.6 1.6	11.80 .32	55.4 1.9	35.21 .65	48.9 1.2	34.61 .33	32.0 1.9
Dec. 4.7	10.43 +.35	57.0 −1.5	12.13 +.32	53.5 −1.8	35.87 +.66	47.9 −0.7	34.95 +.34	30.2 −1.8
14.7	10.78 .34	55.7 1.3	12.45 .32	51.7 1.7	36.52 .64	47.5 −0.2	35.29 .33	28.5 1.6
24.7	11.10 .31	54.6 1.0	12.76 .30	50.0 1.6	37.14 .61	47.6 +0.4	35.61 .32	27.0 1.4
34.6	11.40 +.28	53.7 −0.7	13.04 +.27	48.5 −1.4	37.73 +.55	48.2 +0.9	35.92 +.29	25.7 −1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Draconis (H.)		ρ Leonis.		η Argus.		ι Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	$10^{h}\ 25^{m}$	$+76^{\circ}\ 18'$	$10^{h}\ 26^{m}$	$+\ 9^{\circ}\ 53'$	$10^{h}\ 40^{m}$	$-59^{\circ}\ 4'$	$10^{h}\ 43^{m}$	$+11^{\circ}\ 9'$
	s	″	s	″	s	″	s	″
(Dec. 30.7)	10.19 +.93	29.2 +0.9	40.54 +.29	77.7 −1.7	33.99 +.45	3.3 −2.8	7.84 +.31	38.1 −1.7
Jan. 9.6	11.10 .86	30.4 1.4	40.82 .26	76.1 1.5	34.42 .40	6.3 3.2	8.14 .28	36.5 1.5
19.6	11.89 .72	32.0 1.9	41.07 .23	74.7 1.3	34.78 .33	9.6 3.5	8.40 .24	35.2 1.2
29.6	12.54 .57	34.2 2.4	41.27 .18	73.6 1.0	35.07 .25	13.2 3.6	8.62 .20	34.0 1.0
Feb. 8.6	13.02 .39	36.7 2.7	41.43 .13	72.7 0.7	35.29 .18	16.9 3.7	8.79 .15	33.2 0.7
18.5	13.32 +.20	39.5 +2.0	41.54 +.09	72.1 −0.4	35.43 +.10	20.6 −3.7	8.92 +.10	32.7 −0.4
28.5	13.43 +.02	42.5 3.0	41.60 +.04	71.8 −0.2	35.49 +.02	24.3 3.6	8.99 .06	32.4 −0.1
Mar. 10.5	13.35 −.16	45.5 2.9	41.62 .00	71.8 0.0	35.47 −.05	27.8 3.4	9.03 +.01	32.4 +0.1
20.4	13.10 .33	48.4 2.8	41.59 −.04	71.9 +0.2	35.39 .11	31.1 3.2	9.02 −.03	32.7 0.3
30.4	12.70 .46	51.0 2.5	41.53 .08	72.2 0.4	35.25 .17	34.1 2.9	8.97 .08	33.1 0.5
Apr. 9.4	12.15 −.60	53.4 +2.2	41.44 −.10	72.7 +0.5	35.06 −.22	36.8 −2.5	8.90 −.09	33.6 +0.6
19.4	11.50 .69	55.4 1.8	41.33 .12	73.2 0.6	34.82 .25	39.1 2.1	8.80 .11	34.2 0.7
29.3	10.77 .76	57.0 1.3	41.21 .12	73.8 0.6	34.55 .28	41.0 1.6	8.68 .12	34.9 0.7
May 9.3	10.00 .79	58.0 0.7	41.08 .13	74.4 0.6	34.26 .30	42.4 1.2	8.56 .12	35.6 0.7
19.3	9.20 .80	58.4 +0.2	40.96 .13	75.1 0.6	33.94 .32	43.3 0.7	8.44 .12	36.3 0.7
29.3	8.41 −.78	58.4 −0.3	40.83 −.12	75.7 +0.6	33.62 −.32	43.7 −0.2	8.31 −.12	37.0 +0.7
June 8.2	7.65 .73	57.8 0.9	40.72 .11	76.3 0.6	33.30 .32	43.6 +0.3	8.20 .11	37.6 0.6
18.2	6.95 .67	56.6 1.4	40.62 .09	76.8 0.5	33.00 .30	43.0 0.8	8.09 .10	38.2 0.5
28.2	6.32 .58	55.0 1.8	40.53 .08	77.3 0.5	32.70 .28	42.0 1.3	8.00 .09	38.6 0.4
July 8.1	5.79 .49	53.0 2.3	40.46 .06	77.7 0.4	32.43 .25	40.4 1.7	7.92 .07	39.0 0.3
18.1	5.35 −.38	50.5 −2.6	40.41 −.04	78.0 +0.3	32.19 −.22	38.5 +2.1	7.86 −.05	39.3 +0.2
28.1	5.03 .26	47.7 2.9	40.38 −.02	78.3 +0.2	32.00 .17	36.2 2.4	7.81 .03	39.4 +0.1
Aug. 7.1	4.83 .14	44.6 3.2	40.37 .00	78.4 0.0	31.85 .12	33.7 2.7	7.79 −.01	39.5 −0.1
17.0	4.75 −.01	41.4 3.3	40.39 +.03	78.3 −0.1	31.76 −.06	30.9 2.8	7.79 +.02	39.3 0.2
27.0	4.81 +.12	38.0 3.4	40.43 .06	78.1 0.3	31.73 .00	28.1 2.9	7.82 .04	39.0 0.4
Sept. 6.0	4.99 +.25	34.5 −3.5	40.51 +.09	77.7 −0.5	31.76 +.07	25.2 +2.8	7.88 +.07	38.5 −0.6
16.0	5.31 .38	31.0 3.5	40.61 .12	77.1 0.7	31.87 .15	22.5 2.7	7.97 .10	37.8 0.8
25.9	5.75 .51	27.6 3.4	40.75 .15	76.2 0.9	32.05 .22	19.9 2.4	8.09 .14	36.9 1.0
Oct. 5.9	6.32 .63	24.3 3.2	40.92 .19	75.2 1.2	32.31 .29	17.7 2.0	8.25 .18	35.8 1.3
15.9	7.01 .75	21.2 2.9	41.13 .22	73.9 1.4	32.64 .36	15.9 1.6	8.44 .21	34.4 1.5
25.8	7.81 +.85	18.4 −2.6	41.37 +.25	72.4 −1.6	33.03 +.42	14.6 +1.0	8.67 +.24	32.8 −1.7
Nov. 4.8	8.71 .94	15.9 2.2	41.64 .28	70.8 1.8	33.47 .47	13.9 +0.4	8.93 .27	31.1 1.8
14.8	9.68 1.00	13.9 1.8	41.93 .30	68.9 1.9	33.96 .50	13.8 −0.2	9.22 .30	29.2 1.9
24.8	10.71 1.05	12.4 1.3	42.24 .32	67.0 2.0	34.47 .52	14.3 0.8	9.52 .32	27.2 2.0
Dec. 4.7	11.78 1.07	11.4 −0.7	42.57 +.32	65.0 −2.0	35.00 +.52	15.4 −1.4	9.85 +.33	25.2 −2.0
14.7	12.84 1.05	11.1 −0.1	42.89 .32	63.1 1.9	35.52 .51	17.1 2.0	10.18 .33	23.3 1.9
24.7	13.88 1.00	11.3 +0.5	43.21 .31	61.2 1.8	36.01 .47	19.4 2.5	10.50 .32	21.4 1.8
34.6	14.85 +.93	12.1 +1.1	43.51 +.28	59.6 −1.6	36.46 +.43	22.2 −3.0	10.80 +.30	19.6 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Majoris.		δ Leonis.		δ Crateris.		τ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 10 56	° ′ +62 22	h m 11 7	° ′ +21 9	h m 11 13	° ′ −14 8	h m 11 21	° ′ + 3 29
	s	″	s	″	s	″	s	″
(Dec. 30.7)	31.30 +.56	32.5 0.0	54.34 +.33	37.4 −1.5	30.92 +.31	47.6 −2.4	56.44 +.32	52.7 −2.0
Jan. 9.7	31.84 .51	32.8 +0.6	54.65 .30	36.0 1.2	31.23 .29	50.0 2.4	56.74 .29	50.7 1.9
19.6	32.33 .45	33.6 1.1	54.94 .27	35.0 0.9	31.50 .26	52.4 2.3	57.02 .26	48.9 1.7
29.6	32.74 .38	35.0 1.6	55.19 .23	34.3 0.5	31.74 .22	54.7 2.2	57.26 .23	47.4 1.4
Feb. 8.6	33.08 .29	36.8 2.0	55.40 .18	34.0 −0.2	31.94 .17	56.8 2.1	57.47 .18	46.0 1.2
18.5	33.32 +.19	39.0 +2.3	55.55 +.13	34.0 +0.2	32.08 +.13	58.8 −1.9	57.63 +.14	45.0 −0.9
28.5	33.46 +.10	41.4 2.6	55.66 .08	34.3 0.5	32.19 .08	60.6 1.7	57.74 .09	44.2 0.6
Mar. 10.5	33.51 .00	44.1 2.7	55.72 +.04	34.9 0.7	32.25 +.04	62.2 1.4	57.82 .05	43.7 0.4
20.5	33.47 −.09	46.8 2.7	55.74 −.01	35.7 0.9	32.27 .00	63.5 1.2	57.85 +.01	43.5 −0.1
30.4	33.34 .16	49.4 2.6	55.71 .04	36.7 1.0	32.25 −.03	64.5 0.9	57.84 −.02	43.5 +0.1
Apr. 9.4	33.14 −.23	51.9 +2.3	55.65 −.07	37.8 +1.1	32.20 −.06	65.3 −0.7	57.80 −.06	43.7 +0.3
19.4	32.88 .29	54.1 2.1	55.56 .10	38.9 1.1	32.13 .08	65.8 0.4	57.74 .07	44.0 0.4
29.4	32.57 .32	55.9 1.7	55.46 .11	40.0 1.1	32.04 .10	66.1 0.2	57.65 .09	44.5 0.5
May 9.3	32.23 .35	57.4 1.3	55.34 .12	41.0 1.0	31.94 .11	66.2 0.0	57.56 .10	45.0 0.6
19.3	31.88 .36	58.4 0.8	55.21 .13	42.0 0.9	31.82 .12	66.1 +0.2	57.45 .11	45.7 0.6
29.3	31.52 −.36	59.0 +0.3	55.08 −.13	42.8 +0.8	31.70 −.12	65.8 +0.4	57.34 −.11	46.3 +0.7
June 8.2	31.16 .34	59.1 −0.2	54.95 .12	43.5 0.6	31.59 .12	65.2 0.6	57.23 .11	47.0 0.7
18.2	30.83 .32	58.7 0.6	54.83 .12	44.0 0.4	31.47 .11	64.5 0.8	57.12 .11	47.7 0.7
28.2	30.52 .29	57.8 1.1	54.72 .11	44.3 +0.2	31.36 .11	63.7 0.9	57.02 .10	48.3 0.6
July 8.2	30.25 .25	56.5 1.5	54.62 .09	44.4 0.0	31.26 .09	62.7 1.0	56.92 .09	49.0 0.6
18.1	30.01 −.21	54.8 −1.9	54.53 −.08	44.3 −0.2	31.17 −.08	61.6 +1.1	56.84 −.08	49.5 +0.5
28.1	29.83 .16	52.6 2.3	54.47 .06	44.0 0.4	31.10 .07	60.5 1.2	56.77 .06	50.0 0.4
Aug. 7.1	29.70 .10	50.2 2.6	54.42 .03	43.6 0.6	31.04 .05	59.3 1.2	56.71 .04	50.4 0.3
17.1	29.62 −.05	47.5 2.8	54.40 −.01	42.9 0.8	31.01 −.02	58.2 1.1	56.68 −.02	50.6 +0.2
27.0	29.60 +.01	44.6 3.0	54.40 +.01	42.0 1.0	31.00 +.01	57.1 1.0	56.67 .00	50.8 0.0
Sept. 6.0	29.65 +.07	41.4 −3.2	54.44 +.05	40.9 −1.2	31.02 +.04	56.1 +0.9	56.69 +.03	50.7 −0.2
16.0	29.76 .15	38.2 3.3	54.50 .08	39.6 1.4	31.08 .07	55.3 0.7	56.74 .07	50.4 0.4
25.9	29.94 .21	34.9 3.3	54.60 .12	38.1 1.6	31.17 .11	54.8 0.4	56.82 .10	49.9 0.6
Oct. 5.9	30.19 .28	31.6 3.2	54.74 .16	36.4 1.8	31.30 .15	54.5 +0.1	56.94 .14	49.2 0.9
15.9	30.50 .35	28.4 3.1	54.92 .19	34.5 2.0	31.46 .19	54.5 −0.2	57.09 .18	48.2 1.1
25.9	30.89 +.41	25.4 −2.9	55.13 +.23	32.4 −2.1	31.67 +.23	54.9 −0.6	57.29 +.21	47.0 −1.4
Nov. 4.8	31.33 .47	22.6 2.7	55.38 .27	30.3 2.2	31.92 .26	55.7 0.9	57.52 .25	45.4 1.6
14.8	31.83 .52	20.1 2.4	55.66 .30	28.1 2.2	32.20 .29	56.8 1.3	57.78 .28	43.7 1.8
24.8	32.37 .56	17.9 1.9	55.98 .32	25.9 2.2	32.50 .31	58.3 1.6	58.08 .30	41.8 2.0
Dec. 4.8	32.94 +.58	16.3 −1.4	56.31 +.34	23.8 −2.0	32.82 +.33	60.0 −1.9	58.39 +.32	39.8 −2.1
14.7	33.53 .59	15.1 0.9	56.65 .34	21.8 1.9	33.15 .33	62.0 2.1	58.71 .32	37.7 2.1
24.7	34.12 .57	14.4 −0.4	56.99 .33	20.0 1.7	33.48 .32	64.2 2.3	59.04 .32	35.6 2.1
34.7	34.68 +.54	14.4 +0.2	57.32 +.32	18.5 −1.4	33.80 +.30	66.6 −2.4	59.35 +.31	33.6 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Draconis.		υ Leonis.		β Leonis.		γ Ursæ Majoris.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$11^{h}\,24^{m}$	$+69^{\circ}\,57'$	$11^{h}\,30^{m}$	$-\,0^{\circ}\,10'$	$11^{h}\,43^{m}$	$+15^{\circ}\,13'$	$11^{h}\,47^{m}$	$+54^{\circ}\,20'$
	s	″	s	″	s	″	s	″
(Dec. 30.7)	27.60 +.74	71.0 −0.1	58.70 +.32	48.0 −2.1	6.51 +.33	21.3 −1.9	41.09 +.48	19.9 −0.9
Jan. 9.7	28.32 .69	71.1 +0.5	59.01 .30	50.1 2.0	6.83 .31	19.6 1.6	41.56 .46	19.3 −0.3
19.6	28.98 .62	71.9 1.1	59.29 .27	52.0 1.8	7.13 .28	18.2 1.3	42.01 .42	19.3 +0.3
29.6	29.56 .54	73.3 1.6	59.54 .23	53.7 1.6	7.39 .25	17.1 0.9	42.40 .37	19.9 0.8
Feb. 8.6	30.05 .43	75.2 2.1	59.75 .19	55.2 1.4	7.62 .21	16.3 0.6	42.75 .31	21.0 1.3
18.6	30.43 +.31	77.5 +2.5	59.92 +.15	56.5 −1.1	7.80 +.16	15.9 −0.3	43.03 +.24	22.5 +1.8
28.5	30.68 .19	80.1 2.7	60.04 .10	57.5 0.9	7.94 .12	15.8 +0.1	43.23 .17	24.5 2.1
Mar. 10.5	30.80 +.06	83.0 2.9	60.12 .06	58.2 0.6	8.04 .07	16.0 0.3	43.37 .10	26.7 2.4
20.5	30.80 −.06	85.9 2.9	60.16 +.02	58.7 0.3	8.09 +.03	16.5 0.6	43.42 +.02	29.2 2.5
30.4	30.69 .17	88.8 2.8	60.16 −.01	58.9 −0.1	8.10 −.01	17.2 0.8	43.41 −.04	31.8 2.6
Apr. 9.4	30.46 −.27	91.6 +2.7	60.14 −.04	58.9 +0.1	8.07 −.04	18.0 +0.9	43.34 −.10	34.4 +2.5
19.4	30.14 .36	94.1 2.4	60.08 .07	58.8 0.2	8.02 .06	19.0 1.0	43.21 .15	36.8 2.3
29.4	29.75 .43	96.3 2.0	60.00 .08	58.4 0.4	7.94 .08	20.0 1.0	43.04 .19	39.0 2.1
May 9.3	29.30 .47	98.1 1.5	59.91 .10	58.0 0.5	7.85 .10	21.0 1.0	42.82 .22	41.0 1.8
19.3	28.80 .50	99.4 1.1	59.81 .10	57.5 0.6	7.74 .11	22.0 1.0	42.59 .25	42.6 1.4
29.3	28.29 −.52	100.2 +0.6	59.70 −.11	56.9 +0.6	7.63 −.12	22.9 +0.9	42.33 −.26	43.8 +1.0
June 8.3	27.77 .51	100.5 0.0	59.59 .11	56.2 0.7	7.51 .12	23.7 0.8	42.07 .26	44.6 0.6
18.2	27.26 .50	100.2 −0.5	59.49 .11	55.6 0.7	7.40 .12	24.4 0.6	41.81 .26	45.0 +0.1
28.2	26.78 .47	99.5 1.0	59.38 .10	54.9 0.7	7.28 .11	25.0 0.5	41.56 .25	44.9 −0.3
July 8.2	26.33 .42	98.2 1.5	59.28 .09	54.2 0.7	7.18 .10	25.4 0.3	41.32 .23	44.3 0.8
18.1	25.93 −.37	96.5 −1.9	59.20 −.08	53.5 +0.6	7.08 −.09	25.6 +0.1	41.09 −.21	43.3 −1.2
28.1	25.59 .31	94.4 2.3	59.12 .07	52.9 0.6	6.99 .08	25.7 0.0	40.90 .18	41.9 1.6
Aug. 7.1	25.31 .24	91.9 2.7	59.06 .05	52.3 0.5	6.92 .06	25.5 −0.2	40.73 .15	40.1 2.0
17.1	25.11 .17	89.0 3.0	59.02 −.03	51.9 0.4	6.86 .04	25.2 0.4	40.60 .11	38.0 2.3
27.0	24.98 −.08	85.9 3.2	59.00 .00	51.6 0.2	6.83 −.02	24.7 0.6	40.51 .07	35.6 2.6
Sept. 6.0	24.94 .00	82.6 −3.4	59.01 +.02	51.4 +0.1	6.83 +.01	23.9 −0.9	40.47 −.02	32.8 −2.8
16.0	24.98 +.09	79.1 3.5	59.05 .05	51.5 −0.2	6.85 .04	23.0 1.1	40.47 +.03	29.9 3.0
26.0	25.12 .19	75.5 3.6	59.12 .09	51.8 0.4	6.91 .08	21.8 1.3	40.53 .09	26.7 3.2
Oct. 5.9	25.36 .28	72.0 3.5	59.23 .13	52.3 0.7	7.01 .12	20.3 1.5	40.64 .15	23.5 3.3
15.9	25.68 .37	68.5 3.4	59.38 .17	53.1 0.9	7.14 .16	18.7 1.7	40.82 .21	20.2 3.3
25.9	26.10 +.46	65.2 −3.2	59.56 +.21	54.1 −1.2	7.32 +.20	16.8 −1.9	41.06 +.27	16.9 −3.2
Nov. 4.8	26.61 .55	62.0 3.0	59.79 .24	55.5 1.5	7.54 .24	14.8 2.1	41.36 .33	13.8 3.1
14.8	27.20 .63	59.3 2.6	60.05 .28	57.1 1.7	7.79 .27	12.7 2.2	41.71 .38	10.8 2.9
24.8	27.86 .69	56.9 2.2	60.34 .30	58.9 1.9	8.08 .30	10.5 2.2	42.11 .42	8.1 2.6
Dec. 4.8	28.57 +.73	55.0 −1.6	60.65 +.32	60.8 −2.0	8.39 +.32	8.3 −2.2	42.55 +.46	5.7 −2.2
14.7	29.32 .75	53.6 1.1	60.97 .32	62.9 2.1	8.72 .33	6.1 2.1	43.02 .48	3.7 1.7
24.7	30.08 .75	52.8 −0.5	61.30 .32	65.0 2.1	9.05 .33	4.1 1.9	43.50 .48	2.3 1.2
34.7	30.82 +.73	52.6 +0.1	61.61 + 30	67.1 −2.0	9.38 +.32	2.2 −1.7	43.98 +.47	1.3 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* Virginis.		4 Draconis (H.)		γ Corvi.		β Chamæleontis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$11^{h}\ 59^{m}$	$+\ 9^{\circ}\ 22'$	$12^{h}\ 6^{m}$	$+78^{\circ}\ 15'$	$12^{h}\ 9^{m}$	$-16^{\circ}\ 53'$	$12^{h}\ 11^{m}$	$-78^{\circ}\ 39'$
	s	″	s	″	s	″	s	″
(Dec. 30.7)	15.90 +.32	48.2 −2.0	42.03+1.18	33.9 −0.4	48.53 +.33	32.6 −2.1	34.38+1.23	29.8 −1.4
Jan. 9.7	16.22 .31	46.3 1.8	43.20 1.15	33.8 +0.2	48.86 .32	34.8 2.3	35.59 1.17	31.5 2.0
19.7	16.52 .29	44.7 1.5	44.32 1.08	34.3 0.8	49.17 .30	37.1 2.3	36.71 1.07	33.7 2.5
29.6	16.79 .25	43.3 1.3	45.35 .97	35.4 1.4	49.45 .26	39.3 2.2	37.72 .94	36.4 2.9
Feb. 8.6	17.03 .21	42.2 0.9	46.25 .83	37.1 2.0	49.70 .23	41.5 2.1	38.60 .80	39.5 3.2
18.6	17.22 +.17	41.4 −0.6	47.00 +.66	39.4 +2.4	49.90 +.19	43.6 −2.0	39.31 +.64	42.9 −3.5
28.6	17.38 .13	41.0 −0.3	47.56 .47	42.0 2.8	50.07 .14	45.5 1.8	39.87 .47	46.6 3.7
Mar. 10.5	17.48 .09	40.8 0.0	47.92 .26	44.9 3.0	50.19 .10	47.2 1.6	40.26 .30	50.3 3.8
20.5	17.55 .05	41.0 +0.2	48.08 +.06	48.0 3.1	50.27 .06	48.6 1.4	40.47 +.13	54.1 3.8
30.5	17.58 +.01	41.3 0.5	48.04 −.14	51.1 3.1	50.31 +.03	49.8 1.1	40.52 −.03	57.8 3.7
Apr. 9.4	17.58 −.02	41.9 +0.6	47.80 −.33	54.2 +3.0	50.32 −.01	50.8 −0.9	40.40 −.19	61.5 −3.5
19.4	17.54 .05	42.6 0.8	47.38 .50	57.0 2.7	50.30 .03	51.6 0.6	40.14 .34	64.9 3.3
29.4	17.48 .07	43.4 0.8	46.81 .64	59.6 2.4	50.25 .06	52.1 0.4	39.73 .48	68.0 3.0
May 9.4	17.41 .08	44.2 0.9	46.11 .76	61.8 2.0	50.19 .07	52.4 −0.2	39.18 .60	70.8 2.6
19.3	17.32 .10	45.1 0.9	45.30 .85	63.5 1.5	50.10 .09	52.5 0.0	38.53 .71	73.2 2.2
29.3	17.21 −.10	46.0 +0.8	44.42 −.91	64.8 +1.0	50.01 −.10	52.4 +0.2	37.77 −.80	75.2 −1.7
June 8.3	17.11 .11	46.8 0.8	43.49 .94	65.4 +0.4	49.90 .11	52.1 0.4	36.94 .87	76.7 1.2
18.3	17.00 .11	47.5 0.7	42.54 .94	65.6 −0.1	49.79 .11	51.7 0.6	36.04 .91	77.7 0.7
28.2	16.88 .11	48.2 0.6	41.60 .93	65.2 0.7	49.68 .12	51.0 0.7	35.11 .94	78.1 −0.1
July 8.2	16.78 .11	48.7 0.5	40.70 .88	64.2 1.2	49.56 .12	50.2 0.8	34.17 .93	78.0 +0.4
18.2	16.68 −.10	49.2 +0.4	39.84 −.82	62.8 −1.7	49.45 −.11	49.3 +1.0	33.25 −.90	77.3 +0.9
28.1	16.58 .09	49.5 0.2	39.06 .74	60.8 2.2	49.34 .10	48.3 1.1	32.37 .84	76.1 1.5
Aug. 7.1	16.50 .07	49.6 +0.1	38.38 .64	58.5 2.6	49.24 .09	47.2 1.1	31.57 .75	74.4 1.9
17.1	16.44 .06	49.6 −0.1	37.80 .52	55.7 3.0	49.16 .07	46.2 1.1	30.88 .63	72.2 2.4
27.1	16.39 .03	49.4 0.3	37.34 .39	52.6 3.2	49.10 .05	45.1 1.1	30.32 .48	69.6 2.7
Sept. 6.0	16.37 −.01	49.0 −0.5	37.01 −.26	49.2 −3.5	49.07 −.02	44.0 +1.0	29.91 −.31	66.8 +2.9
16.0	16.38 +.03	48.4 0.7	36.83 −.11	45.6 3.7	49.07 +.01	43.1 0.8	29.69 −.13	63.8 3.0
26.0	16.42 .06	47.5 1.0	36.80 +.05	41.9 3.8	49.10 .05	42.4 0.6	29.67 +.08	60.7 3.1
Oct. 6.0	16.51 .10	46.4 1.2	36.93 .21	38.1 3.8	49.17 .10	41.9 0.4	29.85 .29	57.7 3.0
15.9	16.63 .14	45.1 1.4	37.22 .38	34.4 3.7	49.29 .14	41.7 +0.1	30.25 .50	54.8 2.8
25.9	16.79 +.18	43.6 −1.7	37.68 +.54	30.8 −3.5	49.45 +.18	41.8 −0.3	30.84 +.69	52.2 +2.4
Nov. 4.9	16.99 .22	41.8 1.9	38.30 .70	27.3 3.3	49.66 .23	42.2 0.6	31.63 .86	49.9 2.0
14.8	17.23 .26	39.8 2.0	39.07 .84	24.2 3.0	49.90 .26	43.0 1.0	32.58 1.02	48.2 1.5
24.8	17.51 .29	37.8 2.1	39.98 .97	21.4 2.5	50.19 .30	44.1 1.3	33.66 1.14	47.0 0.9
Dec. 4.8	17.81 +.31	35.6 −2.2	41.01 1.07	19.1 −2.0	50.50 +.32	45.6 −1.6	34.85 1.22	46.4 +0.3
14.8	18.13 .32	33.4 2.1	42.12 1.14	17.4 1.5	50.82 .33	47.3 1.9	36.08 1.25	46.4 −0.4
24.7	18.45 .33	31.3 2.1	43.29 1.18	16.2 0.9	51.16 .34	49.3 2.1	37.34 1.25	47.1 1.0
34.7	18.78 +.32	29.3 −1.9	44.47+1.18	15.6 −0.2	51.49 +.33	51.5 −2.2	38.57+1.20	48.4 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Virginis.		α¹ Crucis.		β Corvi.		κ Draconis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	12h 13m	− 0° 1′	12h 20m	−62° 26′	12h 28m	−22° 44′	12h 28m	+70° 25′
	s	″	s	″	s	″	s	″
(Dec. 30.7)	56.17 +.33	5.9 −2.1	7.13 +.59	49.2 −1.6	15.63 +.35	56.4 −2.0	28.65 +.75	35.5 −1.0
Jan. 9.7	56.49 .31	8.0 2.0	7.70 .56	51.1 2.1	15.98 .34	58.5 2.2	29.40 .74	34.9 −0.3
19.7	56.79 .29	9.9 1.8	8.25 .52	53.5 2.6	16.30 .31	60.8 2.3	30.13 .71	34.9 +0.3
29.7	57.07 .26	11.7 1.6	8.74 .46	56.2 2.9	16.60 .28	63.1 2.3	30.81 .65	35.6 1.0
Feb. 8.6	57.31 .22	13.2 1.4	9.18 .40	59.3 3.2	16.87 .25	65.5 2.3	31.43 .57	36.8 1.5
18.6	57.52 +.18	14.5 −1.1	9.54 +.33	62.6 −3.4	17.09 +.21	67.7 −2.2	31 95 +.47	38.5 +2.0
28.6	57.68 .14	15.5 0.9	9.83 .25	66.0 3.5	17.28 .17	69.9 2.1	32.36 .36	40.9 2.5
Mar. 10.5	57.80 .10	16.2 0.6	10.05 .18	69.5 3.5	17.42 .12	71.8 1.9	32.66 .24	43.6 2.8
20.5	57.89 .07	16.6 0.3	10.19 .10	73.0 3.4	17.53 .08	73.6 1.7	32.84 +.12	46.4 3.0
30.5	57.93 +.03	16.8 −0.1	10.25 +.03	76.4 3.3	17.59 .05	75.2 1.4	32.90 .00	49.5 3.0
Apr. 9.5	57.94 .00	16.8 +0.1	10.25 −.03	79.6 −3.1	17.62 +.01	76.5 −1.2	32.83 −.12	52.5 +3.0
19.4	57.93 −.03	16.6 0.3	10.19 .09	82.6 2.8	17.62 −.02	77.6 1.0	32.66 .23	55.5 2.8
29.4	57.89 .05	16.2 0.4	10.07 .15	85.3 2.6	17.59 .04	78.5 0.8	32.38 .32	58.2 2.6
May 9.4	57.82 .07	15.8 0.5	9.89 .20	87.7 2.2	17.54 .06	79.1 0.5	32.03 .39	60.6 2.2
19.4	57.75 .08	15.2 0.6	9.67 .24	89.7 1.8	17.46 .08	79.5 −0.3	31.60 .45	62.7 1.8
29.3	57.66 −.09	14.6 +0.7	9.41 −.28	91.2 −1.3	17.38 −.10	79.6 0.0	31.13 −.50	64.3 +1.4
June 8.3	57.56 .10	13.9 0.7	9.12 .31	92.4 0.9	17.27 .11	79.6 +0.2	30.61 .53	65.4 0.9
18.3	57.46 .11	13.2 0.7	8.80 .33	93.0 −0.4	17.16 .12	79.3 0.4	30.08 .54	66.0 +0.3
28.2	57.35 .11	12.5 0.7	8.46 .34	93.2 +0.1	17.04 .12	78.8 0.6	29.54 .54	66.0 −0.2
July 8.2	57.24 .11	11.8 0.7	8.12 .34	92.8 0.6	16.92 .12	78.1 0.8	29.01 .52	65.5 0.7
18.2	57.14 −.10	11.2 +0.6	7.78 −.34	92.0 +1.1	16.79 −.12	77.2 +1.0	28.50 −.50	64.6 −1.2
28.2	57.04 .09	10.6 0.6	7.45 .32	90.8 1.5	16.67 .12	76.2 1.1	28.02 .46	63.0 1.7
Aug. 7.1	56.95 .08	10.1 0.5	7.15 .29	89.0 1.9	16.56 .11	75.0 1.2	27.58 .41	61.1 2.2
17.1	56.87 .07	9.6 0.3	6.88 .24	87.0 2.2	16.46 .09	73.8 1.3	27.20 .35	58.7 2.6
27.1	56.82 .04	9.4 +0.2	6.67 .18	84.6 2.5	16.38 .07	72.5 1.3	26.89 .28	56.0 2.9
Sept. 6.1	56.78 −.02	9.2 0.0	6.52 −.12	82.0 +2.7	16.32 −.04	71.3 +1.2	26.64 −.20	52.9 −3.2
16.0	56.78 +.01	9.3 −0.2	6.44 −.04	79.2 2.8	16.30 −.01	70.1 1.1	26.48 .12	49.6 3.4
26.0	56.81 .05	9.6 0.4	6.44 +.04	76.5 2.7	16.31 +.03	69.0 1.0	26.42 −.02	46.0 3.6
Oct. 6.0	56.88 .09	10.1 0.6	6.52 .13	73.8 2.6	16.37 .08	68.2 0.7	26.44 +.08	42.4 3.7
15.9	56.98 .13	10.9 0.9	6.70 .22	71.3 2.4	16.47 .13	67.6 0.5	26.57 .18	38.6 3.7
25 9	57.13 +.17	11.9 −1.2	6.97 +.31	69.1 +2.0	16.62 +.17	67.3 +0.1	26.81 +.29	34.9 −3.6
Nov. 4.9	57.32 .21	13.2 1.4	7.33 .40	67.3 1.6	16.82 .22	67.3 −0.2	27.15 .39	31.4 3.5
14.9	57.56 .25	14.8 1.7	7.76 .47	66.0 1.1	17.06 .26	67.8 0.6	27.59 .49	28.0 3.2
24.8	57.82 .28	16.6 1.9	8.26 .53	65.2 +0.5	17.34 .30	68.6 1.0	28.13 .58	25.0 2.9
Dec. 4.8	58.12 +.30	18.5 −2.0	8.81 +.57	65.0 −0.1	17.65 +.32	69.7 −1.3	28.75 +.65	22.3 −2.4
14.8	58.43 .32	20.6 2.1	9.39 .59	65.4 0.7	17.98 .34	71.2 1.7	29.44 .71	20.1 1.9
24.8	58.76 .33	22.7 2.1	9.98 .59	66.4 1.3	18.33 .35	73.0 1.9	30.17 .74	18.4 1.3
34.7	59.08 +.32	24.8 −2.1	10.57 +.58	67.9 −1.8	18.67 +.34	75.1 −2.1	30.92 +.76	17.4 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	32^{2} Camelop. (H.)		α^{2} Can. Venaticorum.		θ Virginis.		α Virginis. (*Spica.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$12^{h}\ 48^{m}$	$+84^{\circ}\ 2'$	$12^{h}\ 50^{m}$	$+38^{\circ}\ 56'$	$13^{h}\ 3^{m}$	$-\ 4^{\circ}\ 54'$	$13^{h}\ 19^{m}$	$-10^{\circ}\ 33'$
	s	″	s	″	s	″	s	″
(Dec. 30.8)	11.96 +2.16	31.7 −0.9	33.54 +.38	43.9 −1.9	54.24 +.33	53.6 −2.0	2.45 +.33	1.5 −2.0
Jan. 9.7	14.14 2.17	31.1 −0.2	33.92 .38	42.3 1.4	54.57 .32	55.7 2.0	2.78 .33	3.5 2.0
19.7	16.30 2.12	31.2 +0.4	34.30 .36	41.2 0.9	54.89 .31	57.6 1.9	3.11 .32	5.4 2.0
29.7	18.37 1.99	32.0 1.1	34.65 .34	40.6 −0.3	55.19 .29	59.5 1.8	3.42 .30	7.4 1.9
Feb. 8.6	20.27 1.78	33.4 1.7	34.97 .30	40.5 +0.2	55.46 .26	61.2 1.6	3.70 .27	9.2 1.7
18.6	21.92 +1.51	35.3 +2.2	35.25 +.26	41.0 +0.7	55.71 +.23	62.7 −1.4	3.96 +.24	10.8 −1.6
28.6	23.28 1.17	37.7 2.6	35.49 .21	41.9 1.2	55.92 .19	63.9 1.1	4.18 .21	12.3 1.4
Mar. 10.6	24.28 .82	40.5 2.9	35.67 .16	43.3 1.6	56.09 .15	64.9 0.9	4.37 .17	13.5 1.1
20.5	24.91 .43	43.5 3.1	35.80 .11	45.0 1.9	56.22 .11	65.6 0.6	4.52 .13	14.5 0.9
30.5	25.14 +.04	46.7 3.2	35.89 .06	47.0 2.1	56.32 .08	66.1 0.4	4.64 .10	15.3 0.7
Apr. 9.5	24.99 −.35	49.9 +3.1	35.92 +.01	49.2 +2.2	56.38 +.05	66.3 −0.1	4.72 +.07	15.9 −0.5
19.5	24.45 .71	53.0 3.0	35.91 −.03	51.4 2.2	56.41 +.02	66.3 0.0	4.77 .04	16.2 0.2
29.4	23.57 1.04	55.8 2.7	35.86 .07	53.6 2.2	56.42 −.01	66.2 +0.2	4.79 +.01	16.4 −0.1
May 9.4	22.37 1.33	58.3 2.3	35.78 .10	55.8 2.1	56.40 .03	65.9 0.3	4.78 −.01	16.4 +0.1
19.4	20.91 1.57	60.5 1.9	35.67 .12	57.7 1.9	56.36 .05	65.5 0.5	4.76 .04	16.2 0.2
29.3	19.24 1.76	62.1 +1.4	35.54 −.14	59.5 +1.6	56.30 −.07	65.0 +0.5	4.71 −.06	16.0 +0.3
June 8.3	17.41 1.89	63.2 0.9	35.39 .16	60.9 1.3	56.22 .08	64.4 0 6	4.64 .08	15.6 0.4
18.3	15.48 1.97	63.8 +0.3	35.22 .17	62.0 1.0	56.14 .09	63.8 0.6	4.56 .09	15.1 0.5
28.3	13.49 1.99	63.9 −0.2	35.05 .17	62.8 0.9	56.04 .11	63.1 0.7	4.46 .10	14.6 0.6
July 8.2	11.51 1.97	63.4 0.8	34.88 .18	63.2 0.6	55.92 .11	62.4 0.7	4.35 .11	13.9 0.7
18.2	9.58 1.80	62.3 −1.3	34.70 −.18	63.2 +0.2	55.81 −.12	61.7 +0.7	4.23 −.12	13.3 +0.7
28.2	7.74 1.78	60.7 1.8	34.53 .17	62.9 −0.2	55.69 .12	61.1 0.6	4.11 .12	12.6 0.7
Aug. 7.2	6.03 1.62	58.6 2.3	34.36 .16	62.1 0.9	55.58 .11	60.5 0.6	3.99 .12	11.8 0.7
17.1	4.50 1.43	56.2 2.7	34.22 .14	61.0 1.3	55.47 .10	59.9 0.5	3.87 .11	11.1 0.7
27.1	3.18 1.21	53.3 3.0	34.09 .11	59.5 1.6	55.38 .09	59.4 0.4	3.76 .10	10.5 0.6
Sept. 6.1	2.08 −.96	50.1 −3.3	33.99 −.08	57.7 −2.0	55.30 −.06	59.1 +0.3	3.67 −.08	9.9 +0.5
16.0	1.26 .69	46.6 3.6	33.92 .05	55.6 2.3	55.25 −.04	58.9 +0.1	3.61 .05	9.4 0.4
26.0	0.71 .39	42.9 3.7	33.89 −.01	53.2 2.5	55.23 .00	58.8 −0.1	3.57 −.02	9.0 +0.2
Oct. 6.0	0.48 −.08	39.1 3 8	33.91 +.04	50 6 2.7	55.24 +.04	59.0 0.3	3.58 +.02	8.9 0.0
16.0	0.56 +.25	35.3 3.8	33.97 .09	47.8 2.9	55.30 .06	59.5 0.6	3.62 .07	9.0 −0.2
25.9	0.98 +.58	31.5 −3.7	34.08 +.14	44.8 −3.0	55.40 +.13	60.2 −0.8	3.71 +.11	9.3 −0.5
Nov. 4.9	1.72 .91	27.9 3.5	34.25 .19	41.7 3.1	55.55 .17	61.1 1.1	3.85 .16	9.9 0.7
14.9	2.79 1.22	24.5 3.2	34.47 .24	38.6 3.1	55.75 .22	62.4 1.4	4.03 .21	10.8 1.0
24.9	4.16 1.51	21.4 2.9	34.74 .29	35.6 2.9	55.98 .25	63.8 1.6	4.26 .25	11.9 1.3
Dec. 4.8	5.81 1.76	18.8 −2.4	35.05 +.33	32.8 −2.7	56.26 +.28	65.5 −1 8	4.53 +.28	13.4 −1.5
14.8	7.68 1.97	16.6 1.9	35.39 .36	30.1 2.5	56.55 .31	67.4 1.9	4.82 .31	15.0 1.7
24.8	9.73 2.11	15.0 1.3	35.76 .38	27.8 2.1	56.87 .32	69.4 2.0	5.14 .32	16.8 1.9
34.7	11.89 +2.19	14.0 −0.7	36.15 +.40	26.0 −1.7	57.20 +.33	71.4 −2.0	5.47 +.33	18.7 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Virginis.		η Ursæ Majoris.		η Bootis.		β Centauri.	
	Right Ascension.	Declination	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 13 28	° ′ 0 0	h m 13 42	° ′ +49 53	h m 13 49	° ′ +18 58	h m 13 55	° ′ −59 48
	s	″	s	″	s	″	s	″
(Dec. 30.8)	44.42 +.32	+ 6.0 −2.1	55.36 +.42	33.3 −2.2	7.02 +.32	55.6 −2.3	35.29 +.56	13.7 −0.4
Jan. 9.8	44.74 .32	3.9 2.0	55.78 .43	31.4 1.7	7.34 .33	53.4 2.0	35.86 .57	14.4 0.9
19.7	45.06 .31	2.0 1.8	56.22 .43	30.0 1.1	7.68 .33	51.6 1.7	36.43 .56	15.5 1.4
29.7	45.37 .30	+ 0 2 1.6	56 64 .41	29.2 −0.5	8.00 .31	50.1 1.3	36.99 .54	17.1 1.8
Feb. 8.7	45.65 .27	− 1.3 1.4	57.04 .39	29.0 +0.1	8.30 .29	49.0 0.9	37.51 .51	19.1 2.2
18.7	45.91 +.24	− 2.5 −1.1	57.41 +.35	29.4 +0.7	8.58 +.26	48.4 −0.4	38.00 +.46	21.4 −2.4
28.6	46.14 .21	3.5 0.8	57.73 .30	30.4 1.3	8.83 .23	48.1 0.0	38.44 .41	23.9 2.7
Mar. 10.6	46.32 .17	4.2 0.6	58.01 .25	32.0 1.8	9.04 .20	48.3 +0.4	38.83 .36	26.7 2.8
20.6	46.48 .14	4.6 −0.3	58.23 .19	34.0 2.2	9.22 .16	48.9 0.7	39.15 .30	29.6 2.9
30.5	46.60 .10	4.8 0.0	58.39 .13	36.3 2.5	9.36 .12	49.8 1.1	39.42 .24	32.6 3.0
Apr. 9.5	46.69 +.07	− 4.7 +0.2	58.49 +.08	38.9 +2.7	9.46 +.09	51.0 +1.3	39.63 +.18	35.5 −2.9
19.5	46.74 .04	4.4 0.4	58.54 +.02	41.6 2.7	9.53 .05	52.4 1.5	39.78 .12	38.4 2.8
29.5	46.77 +.01	3.9 0.5	58.54 −.03	44.4 2.7	9.56 +.02	54.0 1.6	39.86 +.06	41.2 2.7
May 9.4	46.77 −.01	3.3 0.7	58.48 .08	47.1 2.6	9.57 −.01	55.6 1.6	39.89 .00	43.8 2.5
19.4	46.75 .03	2.6 0.7	58.38 .12	49.6 2.4	9.55 .03	57.2 1.6	39.86 −.06	46.2 2.3
29.4	46.70 −.05	− 1.9 +0.8	58.25 −.15	52.0 +2.2	9.50 −.06	58.8 +1.5	39.78 −.11	48.4 −2.0
June 8.4	46.64 .07	1.1 0.8	58.08 .18	54.0 1.8	9.44 .08	60.2 1.4	39.64 .16	50.2 1.6
18.3	46.56 .09	− 0.3 0.8	57.88 .21	55.6 1.4	9.35 .10	61.5 1.2	39.46 .21	51.6 1.3
28.3	46.46 .10	+ 0.4 0.7	57.66 .23	56.8 1.0	9.24 .11	62.7 1.0	39.23 .25	52.7 0.9
July 8.3	46.36 .11	1.1 0.7	57.42 .24	57.7 0.6	9.12 .13	63.6 0.8	38.96 .28	53.4 −0.4
18.2	46.24 −.12	+ 1.8 +0.6	57.17 −.25	58.0 +0.1	8.99 −.14	64.3 +0.6	38.67 −.30	53.6 0.0
28.2	46.12 .12	2.4 0.5	56.92 .25	57.9 −0.3	8.84 .14	64.7 +0.3	38.35 .32	53.4 +0.5
Aug. 7.2	45.99 .12	2.9 0 5	56.67 .25	57.3 0.8	8.70 .14	64.9 0.0	38.03 .32	52.7 0.9
17.2	45.87 .12	3.3 0.4	56.42 .24	56.3 1.2	8.56 .14	64.8 −0.2	37.71 .31	51.6 1.3
27.1	45.76 .10	3.6 +0.2	56.20 .21	54.8 1.7	8.42 .13	64.4 0.5	37.41 .29	50.1 1.7
Sept. 6.1	45.67 −.08	+ 3.7 0.0	56.00 −.19	53.0 −2.1	8.30 −.11	63.7 −0.8	37.14 −.25	48.3 +2.0
16.1	45.59 .06	3.7 −0.1	55.83 .15	50.7 2.4	8.20 .09	62.8 1.1	36.92 .19	46.1 2.2
26.1	45.55 −.03	3.4 0.3	55.70 .11	48.1 2.8	8.13 .06	61.6 1.4	36.76 .13	43.8 2.4
Oct. 6.0	45.54 +.01	3.0 0.6	55.62 −.05	45.2 3.0	8.09 −.02	60.0 1.7	36.67 −.05	41.3 2.5
16.0	45.57 .05	2.3 0.8	55.59 .00	42.0 3.3	8.09 +.02	58.3 1.9	36.66 +.03	38.8 2.5
26.0	45.65 +.10	+ 1.3 −1.1	55.62 +.07	38.6 −3.4	8.14 +.07	56.2 −2.1	36.74 +.12	36.4 +2.3
Nov. 4.9	45.77 .15	+ 0.1 1.3	55.72 .13	35.2 3.5	8.23 .12	54 0 2.3	36.91 .22	34.2 2.1
14.9	45.94 .19	− 1.3 1.6	55.89 .20	31.6 3.5	8.38 .17	51.6 2.5	37.17 .30	32.2 1.8
24.9	46.15 .23	3.0 1.8	56.11 .26	28.2 3.4	8.57 .21	49.0 2.6	37.52 .38	30.6 1.4
Dec. 4.9	46.40 +.27	− 4.8 −1.9	56.40 +.31	24.9 −3.2	8.80 +.25	46.4 −2.6	37.93 +.45	29.4 +0.9
14.8	46.68 .30	6.8 2.0	56.74 .36	21.9 2.9	9.07 .29	43.9 2.5	38.41 .50	28.5 +0.4
24.8	46.99 .31	8.8 2.1	57.12 .40	19.2 2.5	9.37 .31	41.4 2.4	38.94 .54	28.6 −0.1
34.8	47.31 +.32	−10.9 −2.1	57.53 +.42	16.9 −2.0	9.70 +.33	39.1 −2.2	39.50 +.56	28.9 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Draconis.		α Bootis. (*Arcturus.*)		θ Bootis.		ρ Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 14 1	° ′ +64 55	h m 14 10	° ′ +19 47	h m 14 21	° ′ +52 23	h m 14 26	° ′ +30 52
	s	″	s	″	s	″	s	″
(Dec. 30.8)	11.81 +.54	47.8 −2.2	19.55 +.32	22.8 −2.4	11.97 +.40	15.0 −2.5	47.05 +.32	57.0 −2.6
Jan. 9.8	12.38 .58	45.9 1.6	19.87 .32	20.5 2.1	12.38 .43	12.6 2.0	47.38 .34	54.6 2.2
19.8	12.97 .60	44.5 1.0	20.19 .32	18.6 1.8	12.82 .44	11.0 1.5	47.73 .34	52.7 1.7
29.7	13.57 .59	43.9 −0.3	20.52 .32	17.0 1.4	13.26 .44	9.8 0.8	48.07 .34	51.2 1.3
Feb. 8.7	14.14 .56	43.9 +0.3	20.82 .30	15.8 1.0	13.69 .42	9.3 −0.2	48.40 .32	50.2 0.8
18.7	14.68 +.51	44.6 +1.0	21.11 +.27	15.0 −0.5	14.10 +.39	9.4 +0.4	48.72 +.30	49.7 −0.2
28.7	15.17 .45	45.8 1.6	21.37 .25	14.7 −0.1	14.47 .35	10.2 1.0	49.01 .26	49.7 +0.3
Mar. 10.6	15.58 .38	47.7 2.1	21.60 .21	14.8 +0.3	14.80 .30	11.5 1.6	49.26 .24	50.3 0.8
20.6	15.92 .30	50.0 2.5	21.79 .18	15.4 0.7	15.07 .25	13.3 2.0	49.49 .20	51.3 1.2
30.6	16.18 .21	52.7 2.8	21.95 .14	16.2 1.0	15.29 .19	15.5 2.4	49.67 .16	52.8 1.6
Apr. 9.5	16.34 +.12	55.6 +3.0	22.07 +.11	17.4 +1.3	15.46 +.13	18.1 +2.7	49.81 +.13	54.5 +1.9
19.5	16.42 +.03	58.7 3.1	22.16 .07	18.8 1.5	15.56 .08	20.9 2.9	49.92 .09	56.5 2.1
29.5	16.40 −.05	61.8 3.1	22.22 .04	20.4 1.6	15.61 +.02	23.8 2.9	49.99 .05	58.7 2.2
May 9.5	16.31 .13	64.9 2.9	22.24 +.01	22.1 1.7	15.60 −.03	26.8 2.9	50.02 +.02	61.0 2.3
19.4	16.14 .20	67.7 2.7	22.24 −.02	23.8 1.7	15.54 .08	29.6 2.7	50.02 −.02	63.3 2.2
29.4	15.90 −.27	70.3 +2.4	22.20 −.05	25.4 +1.6	15.43 −.13	32.2 +2.5	49.99 −.05	65.5 +2.1
June 8.4	15.61 .32	72.5 2.0	22.15 .07	27.0 1.5	15.28 .17	34.6 2.2	49.92 .08	67.5 1.9
18.4	15.26 .36	74.4 1.6	22.07 .09	28.4 1.3	15.10 .21	36.6 1.8	49.83 .10	69.3 1.7
28.3	14.88 .40	75.7 1.1	21.97 .11	29.6 1.1	14.87 .24	38.2 1.4	49.72 .13	70.8 1.4
July 8.3	14.46 .42	76.6 0.6	21.84 .13	30.6 0.9	14.62 .26	39.4 1.0	49.58 .15	72.1 1.1
18.3	14.03 −.44	76.9 +0.1	21.71 −.14	31.3 +0.6	14.36 −.28	40.2 +0.5	49.42 −.16	73.1 +0.8
28.2	13.59 .44	76.7 −0.4	21.56 .15	31.8 0.4	14.07 .29	40.5 0.0	49.25 .18	73.7 +0.4
Aug. 7.2	13.15 .44	76.0 1.0	21.41 .15	32.1 +0.1	13.78 .29	40.3 −0.4	49.07 .18	73.9 0.0
17.2	12.72 .42	74.8 1.4	21.26 .15	32.0 −0.2	13.50 .28	39.6 0.9	48.89 .18	73.7 −0.3
27.2	12.31 .39	73.1 1.9	21.11 .15	31.6 0.5	13.22 .27	38.4 1.4	48.70 .18	73.2 0.7
Sept. 6.1	11.94 −.35	71.0 −2.4	20.96 −.13	31.0 −0.8	12.95 −.25	36.8 −1.8	48.54 −.16	72.3 −1.1
16.1	11.62 .30	68.4 2.7	20.84 .11	30.0 1.1	12.72 .22	34.8 2.2	48.38 .14	71.1 1.4
26.1	11.35 .23	65.5 3.1	20.75 .08	28.8 1.4	12.52 .18	32.4 2.6	48.26 .11	69.5 1.8
Oct. 6.1	11.15 .16	62.3 3.4	20.69 −.04	27.3 1.7	12.37 .12	29.6 3.0	48.16 .07	67.5 2.1
16.0	11.03 −.08	58.8 3.6	20.66 .00	25.4 1.9	12.27 −.07	26.5 3.2	48.11 −.03	65.3 2.4
26.0	11.00 +.01	55.1 −3.7	20.68 +.05	23.4 −2.2	12.24 .00	23.1 −3.4	48.10 +.02	62.8 −2.6
Nov. 5.0	11.06 .11	51.4 3.8	20.75 .10	21.1 2.4	12.27 +.07	19.6 3.6	48.15 .07	60.0 2.8
14.9	11.21 .20	47.6 3.7	20.87 .14	18.6 2.6	12.37 .14	16.0 3.6	48.25 .13	57.1 3.0
24.9	11.46 .29	44.0 3.6	21.04 .19	16.0 2.7	12.54 .21	12.4 3.6	48.40 .18	54.1 3.0
Dec. 4.9	11.80 +.38	40.5 −3.3	21.26 +.23	13.3 −2.7	12.78 +.27	8.9 −3.4	48.61 +.23	51.1 −3.0
14.9	12.22 .46	37.3 3.0	21.51 .27	10.6 2.6	13.09 .33	5.6 3.2	48.86 .27	48.1 2.9
24.8	12.71 .52	34.5 2.5	21.80 .30	8.0 2.5	13.44 .38	2.6 2.8	49.15 .30	45.3 2.7
34.8	13.25 +.57	32.3 −2.0	22.11 +.31	5.6 −2.3	13.84 +.41	0.0 −2.3	49.46 +.33	42.8 −2.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	5 Ursæ Minoris.		α² Centauri.		ε Bootis.		α² Libræ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$14^{\mathrm{h}}\ 27^{\mathrm{m}}$	$+76^\circ\ 12'$	$14^{\mathrm{h}}\ 31^{\mathrm{m}}$	$-60^\circ\ 21'$	$14^{\mathrm{h}}\ 39^{\mathrm{m}}$	$+27^\circ\ 33'$	$14^{\mathrm{h}}\ 44^{\mathrm{m}}$	$-15^\circ\ 33'$
	s	″	s	″	s	″	s	″
(Dec. 30.8)	42.98 +.83	39.8 −2.3	41.23 +.54	0.2 +0.1	52.43 +.31	55.8 −2.5	24.63 +.31	13.6 −1.4
Jan. 9.8	43.85 .91	37.8 1.7	41.79 .56	0.3 −0.4	52.75 .33	53.4 2.2	24.95 .32	15.1 1.5
19.8	44.79 .96	36.4 1.1	42.35 .57	1.0 0.9	53.08 .34	51.3 1.8	25.28 .33	16.7 1.6
29.7	45.77 .98	35.6 −0.4	42.92 .56	2.1 1.3	53.41 .33	49.7 1.4	25.61 .32	18.3 1.6
Feb. 8.7	46.74 .96	35.5 +0.2	43.47 .53	3.5 1.7	53.74 .32	48.6 0.9	25.93 .31	19.8 1.5
18.7	47.68 +.91	36.1 +0.9	43.99 +.50	5.4 −2.0	54.05 +.30	47.9 −0.4	26.23 +.29	21.3 −1.4
28.7	48.54 .82	37.3 1.5	44.47 .46	7.5 2.3	54.34 .28	47.8 +0.1	26 51 .27	22.6 1.3
Mar. 10.6	49.31 .71	39.1 2.1	44.91 .41	9.9 2.5	54.60 .24	48.2 0.6	26.77 .24	23.8 1.1
20.6	49.95 .57	41.4 2.5	45.29 .36	12.5 2.6	54.83 .21	49.0 1.0	27.00 .21	24.8 0.9
30.6	50.45 .42	44.1 2.9	45.62 .30	15.2 2.7	55.02 .18	50.2 1.4	27.20 .18	25.6 0.7
Apr. 9.6	50.79 +.26	47.2 +3.1	45.89 +.24	17.9 −2.8	55.18 +.14	51.8 +1.7	27.37 +.15	26.3 −0.6
19.5	50.98 +.10	50.3 3.2	46.10 .18	20.7 2.8	55.30 .10	53.7 2.0	27.51 .13	26.8 0.4
29.5	51.00 −.06	53.6 3.2	46.25 .12	23.4 2.7	55.38 .07	55.8 2.1	27.62 .10	27.1 0.3
May 9.5	50.86 .21	56.7 3.1	46.34 +.06	26.0 2.5	55.43 +.03	57.9 2.2	27.70 .07	27.3 −0.1
19.4	50.58 .35	59.8 2.9	46.37 .00	28.5 2.3	55.45 .00	60.1 2.2	27.75 .04	27.3 0.0
29.4	50.16 −.48	62.5 +2.6	46.34 −.06	30.7 −2.2	55.43 −.03	62.2 +2.1	27.78 +.01	27.3 +0.1
June 8.4	49.61 .60	64.9 2.2	46.24 .12	32.8 1.9	55.39 .06	64.2 1.9	27.77 −.02	27.1 0.2
18.4	48.97 .69	66.9 1.8	46.09 .17	34.5 1.6	55.31 .09	66.1 1.7	27.74 .05	26.9 0.3
28.3	48.24 .77	68.5 1.3	45.89 .23	35.9 1.2	55.21 .11	67.7 1.5	27.68 .07	26.6 0.3
July 8.3	47.44 .82	69.5 0.8	45.64 .27	36.9 0.8	55.09 .13	69.0 1.2	27.60 .10	26.2 0.4
18.3	46.59 −.86	70.0 +0.3	45.35 −.31	37.5 −0.4	54.94 −.15	70.0 +0.9	27.49 −.12	25.8 +0.5
28.3	45.72 .88	70.0 −0.3	45.03 .33	37.6 0.0	54.78 .17	70.7 0.5	27.36 .13	25.2 0.5
Aug. 7.2	44.84 .87	69.4 0.8	44.68 .35	37.4 +0.5	54.61 .18	71.1 +0.2	27.22 .15	24.7 0.6
17.2	43.97 .85	68.4 1.3	44.33 .35	36.7 0.9	54.43 .18	71.1 −0.2	27.07 .15	24.1 0.6
27.2	43.14 .81	66.8 1.8	43.99 .34	35.5 1.3	54.25 .18	70.8 0.5	26.92 .15	23.5 0.6
Sept. 6.1	42.36 −.74	64.7 −2.3	43.66 −.31	34.0 +1.7	54.08 −.16	70.1 −0.9	26.77 −.14	22.9 +0.6
16.1	41.65 .66	62.2 2.7	43.38 .26	32.2 2.0	53.92 .14	69.0 1.2	26.64 .12	22.3 0.5
26.1	41.03 .56	59.4 3.0	43.14 .20	30.0 2 2	53.79 .12	67.6 1.5	26.53 .09	21.8 0.5
Oct. 6.1	40.53 .44	56.2 3.3	42.98 .13	27.7 2.4	53.69 .08	66.0 1.9	26.45 .06	21.4 0.3
16.0	40.15 .31	52.7 3.6	42.89 −.05	25.2 2.5	53.63 −.04	63.9 2.2	26.42 −.02	21.2 +0.2
26.0	39.91 −.16	49.0 −3.7	42.89 +.04	22.8 +2.4	53.61 +.01	61.6 −2.4	26.42 +.03	21.1 0.0
Nov. 5.0	39.84 .00	45.2 3.8	42.98 .14	20.4 2.3	53.65 .06	59.0 2.7	26.48 .08	21.2 −0.2
15.0	39.92 +.17	41.4 3.8	43.16 .23	18.2 2.0	53.73 .11	56.3 2.8	26.58 .13	21.5 0.5
24.9	40.18 .33	37.7 3.6	43.44 .32	16.4 1.7	53.87 .16	53.4 2.9	26.74 .18	22.1 0.7
Dec. 4.9	40.59 +.49	34.2 −3.4	43.80 +.40	14.8 +1.3	54.06 +.21	50.4 −2.9	26.94 +.23	22.9 −0.9
14.9	41.16 .64	30.9 3.1	44.23 .46	13.7 0.9	54.30 .26	47.5 2.9	27.19 .26	24.0 1.2
24.8	41.87 .77	28.0 2.6	44.72 .51	13.1 +0.4	54.57 .29	44.8 2.7	27.47 .29	25.2 1.3
34.8	42.69 +.87	25.7 −2.1	45.25 +.55	13.0 −0.1	54.88 +.31	42.2 −2.4	27.78 +.32	26.7 −1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ursæ Minoris.		β Bootis.		β Libræ.		μ¹ Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 14 50	° ′ +74 37	h m 14 57	° ′ +40 50	h m 15 10	° ′ − 8 56	h m 15 20	° ′ +37 46
	s	″	s	″	s	″	s	″
(Dec. 30.8)	59.36 +.70	45.0 −2.6	31.65 +.32	58.1 −2.8	42.75 +.29	58.9 −1.5	3.51 +.30	68.4 −2.8
Jan. 9.8	60.12 .79	42.6 2.0	31.98 .35	55.5 2.4	43.06 .31	60.5 1.6	3.82 .32	65.7 2.5
19.8	60.94 .85	40.9 1.4	32.34 .36	53.4 1.9	43.37 .32	62.1 1.6	4.16 .34	63.4 2.1
29.8	61.81 .88	39.8 0.8	32.71 .37	51.7 1.4	43.69 .32	63.6 1.5	4.51 .35	61.6 1.6
Feb. 8.7	62.69 .88	39.4 −0.1	33.08 .36	50.6 0.8	44.00 .31	65.0 1.4	4.86 .35	60.3 1.0
18.7	63.56 +.84	39.6 +0.6	33.43 +.35	50.1 −0.2	44.30 +.30	66.3 −1.2	5.21 +.34	59.6 −0.4
28.7	64.38 .78	40.5 1.2	33.77 .32	50.3 +0.4	44.59 .28	67.4 1.0	5.54 .32	59.4 +0.2
Mar. 10.7	65.12 .69	42.0 1.8	34.07 .29	51.0 1.0	44.86 .25	68.3 0.8	5.85 .29	59.9 0.7
20.6	65.76 .59	44.1 2.3	34.34 .25	52.2 1 5	45.10 .23	69.0 0.5	6.13 .26	60.8 1.2
30.6	66.28 .46	46.6 2.7	34.57 .21	53.9 1.9	45.31 .20	69.4 0.3	6.37 .23	62.3 1.7
Apr. 9.6	66.67 +.32	49.5 +3.0	34.76 +.17	56.0 +2.2	45.50 +.17	69.6 −0.1	6.58 +.19	64.2 +2.1
19.5	66.92 .18	52.6 3.2	34.90 .12	58.4 2.5	45.66 .15	69.6 +0.1	6.75 .15	66.5 2.4
29.5	67.02 +.04	55.9 3.2	35.01 .08	61.0 2.7	45.79 .12	69.5 0.2	6.88 .11	69.0 2.6
May 9.5	66.99 −.11	59.1 3.2	35.06 +.04	63.6 2.7	45.89 .09	69.2 0.3	6.96 .07	71.6 2.7
19.5	66.81 .24	62.3 3.0	35.08 .00	66.4 2.7	45.97 .06	68.8 0.4	7.01 +.03	74.3 2.7
29.4	66.51 −.36	65.2 +2.8	35.06 −.04	69.0 +2.6	46.01 +.03	68.4 +0.5	7.01 −.01	76.9 +2.6
June 8.4	66.09 .47	67.8 2.5	34.99 .08	71.4 2.4	46.03 .00	67.8 0.5	6.98 .05	79.5 2.4
18.4	65.57 .57	70.1 2.1	34.89 .11	73.7 2.1	46.02 −.03	67.3 0.6	6.91 .09	81.8 2.2
28.4	64.96 .65	72.0 1.6	34.76 .15	75.6 1.8	45.97 .06	66.7 0.6	6.81 .12	83.9 1.9
July 8.3	64.28 .71	73.3 1.1	34.60 .17	77.2 1.4	45.90 .08	66.1 0.6	6.67 .15	85.7 1.6
18.3	63.54 −.76	74.2 +0.6	34.41 −.20	78.4 +1.0	45.81 −.11	65.6 +0.6	6.51 −.18	87.1 +1.2
28.3	62.76 .79	74.5 +0.1	34.21 .21	79.3 0.6	45.69 .13	65.0 0.6	6.32 .20	88.2 0.9
Aug. 7.2	61.96 .80	74.4 −0.5	33.98 .23	79.6 +0.2	45.55 .14	64.4 0.5	6.11 .22	88.8 +0.4
17.2	61.16 .80	73.6 1.0	33.75 .23	79.6 −0.3	45.40 .15	64.0 0.5	5.89 .23	89.0 0.0
27.2	60.37 .77	72.4 1.5	33.52 .23	79.1 0.7	45.25 .15	63.5 0.4	5.66 .23	88.8 −0.4
Sept. 6.2	59.62 −.72	70.7 −2.0	33.30 −.22	78.2 −1.1	45.10 −.15	63.1 +0.4	5.43 −.22	88.2 −0.8
16.1	58.93 .66	68.5 2.4	33.09 .20	76.8 1.6	44.95 .14	62.8 0.3	5.22 .21	87.1 1.3
26.1	58.31 .58	65.9 2.8	32.90 .17	75.1 2.0	44.82 .11	62.6 +0.1	5.02 .18	85.6 1.7
Oct. 6.1	57.78 .48	62.9 3.1	32.75 .13	72.9 2.3	44.73 .08	62.5 0.0	4.86 .15	83.8 2.1
16.1	57.36 .36	59.6 3.4	32.64 .09	70.4 2.7	44.66 −.04	62.6 −0.2	4.73 .10	81.5 2.4
26.0	57.07 −.23	56.1 −3.6	32.58 −.03	67.6 −2.9	44.64 .00	62.9 −0.4	4.65 −.05	79.0 −2.7
Nov. 5.0	56.91 −.08	52.4 3.8	32.58 +.02	64.6 3.1	44.67 +.05	63.3 0.6	4.62 .00	76.1 3.0
15.0	56.91 +.07	48.6 3.8	32.63 .08	61.3 3.3	44.74 .10	64.0 0.8	4.65 +.06	73.0 3.2
24.9	57.05 .22	44.8 3.7	32.74 .14	58.0 3.4	44.87 .15	64.9 1.0	4.74 .12	69.8 3.3
Dec. 4.9	57.35 +.37	41.1 −3.5	32.92 +.20	54.6 −3.3	45.05 +.20	66.1 −1.2	4.88 +.17	66.5 −3.3
14.9	57.80 .51	37.7 3.3	33.15 .25	51.3 3.2	45.26 .24	67.4 1.4	5.08 .23	63.3 3.2
24.9	58.38 .64	34.6 2.9	33.42 .30	48.2 3.0	45.52 .27	68.8 1.5	5.33 .27	60.2 3.0
34.8	59.07 +.74	32.0 −2.4	33.74 +.34	45.4 −2.6	45.80 +.29	70.4 −1.6	5.62 +.31	57.2 −2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ² Ursæ Minoris.		α Coronæ Borealis.		α Serpentis.		ε Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 15 20	° ′ +72 14	h m 15 29	° ′ +27 6	h m 15 38	° ′ + 6 47	h m 15 44	° ′ + 4 49
	s	″	s	″	s	″	s	″
(Dec. 30.9)	51.50 +.56	47.8 −2.9	43.57 +.27	26.9 −2.7	30.10 +.26	39.4 −2.1	58.84 +.26	51.0 −2.0
Jan. 9.8	52.10 .65	45.2 2.4	43.86 .30	24.3 2.4	30.38 .29	37.4 2.0	59.11 .28	49.0 1.9
19.8	52.79 .71	43.0 1.8	44.17 .32	22.0 2.1	30.67 .30	35.5 1.8	59.40 .30	47.1 1.8
29.8	53.53 .76	41.5 1.2	44.49 .32	20.2 1.7	30.98 .31	33.8 1.6	59.70 .30	45.5 1.6
Feb. 8.8	54.30 .77	40.6 −0.5	44.81 .32	18.7 1.2	31.28 .30	32.3 1.3	60.01 .30	44.0 1.3
18.7	55.07 +.76	40.4 +0.1	45.13 +.31	17.8 −0.7	31.58 +.30	31.2 −1.0	60.31 +.30	42.9 −1.0
28.7	55.82 .72	40.9 0.8	45.44 .30	17.4 −0.2	31.87 .28	30.4 0.6	60.60 .28	42.0 0.6
Mar. 10.7	56.51 .66	42.1 1.4	45.73 .27	17.5 +0.4	32.14 .26	30.0 −0.2	60.87 .27	41.6 −0.3
20.7	57.13 .58	43.8 2.0	45.99 .25	18.1 0.8	32.40 .24	29.9 +0.1	61.13 .24	41.5 0.0
30.6	57.66 .48	46.1 2.5	46.22 .22	19.1 1.3	32.62 .22	30.2 0.4	61.36 .22	41.7 +0.4
Apr. 9.6	58.09 +.37	48.7 +2.8	46.43 +.19	20.6 +1.6	32.83 +.19	30.8 +0.7	61.57 +.20	42.2 +0.6
19.6	58.40 .25	51.7 3.1	46.60 .15	22.4 2.0	33.00 .16	31.7 1.0	61.75 .17	43.0 0.9
29.5	58.59 .13	54.9 3.2	46.73 .12	24.4 2.1	33.15 .13	32.8 1.2	61.90 .14	44.0 1.1
May 9.5	58.66 +.01	58.2 3.3	46.84 .09	26.7 2.3	33.27 .11	34.0 1.3	62.03 .11	45.1 1.2
19.5	58.61 −.11	61.4 3.2	46.90 .05	29.0 2.3	33.36 .08	35.4 1.4	62.13 .08	46.4 1.3
29.5	58.44 −.22	64.6 +3.0	46.94 +.02	31.3 +2.3	33.42 +.05	36.8 +1.4	62.20 +.05	47.6 +1.3
June 8.4	58.17 .33	67.5 2.8	46.94 −.02	33.5 2.2	33.46 +.02	38.2 1.4	62.24 +.02	49.0 1.3
18.4	57.79 .42	70.1 2.4	46.90 .05	35.7 2.0	33.45 −.02	39.5 1.3	62.24 −.01	50.3 1.3
28.4	57.32 .51	72.3 2.0	46.83 .08	37.6 1.6	33.42 .05	40.8 1.2	62.22 .04	51.5 1.2
July 8.4	56.78 .58	74.1 1.6	46.74 .11	39.2 1.5	33.36 .08	42.0 1.1	62.16 .07	52.7 1.1
18.3	56.17 −.63	75.4 +1.1	46.61 −.14	40.6 +1.2	33.27 −.10	43.0 +1.0	62.07 −.10	53.7 +0.9
28.3	55.52 .67	76.2 +0.6	46.46 .16	41.7 0.9	33.16 .13	43.9 0.8	61.96 .12	54.5 0.8
Aug. 7.3	54.83 .70	76.5 0.0	46.29 .18	42.5 0.6	33.02 .15	44.6 0.6	61.83 .14	55.2 0.6
17.2	54.12 .71	76.2 −0.5	46.10 .19	42.9 +0.2	32.86 .16	45.1 0.4	61.68 .16	55.8 0.4
27.2	53.41 .70	75.5 1.0	45.90 .20	42.9 −0.1	32.70 .16	45.4 +0.2	61.52 .16	56.1 0.3
Sept. 6.2	52.72 −.67	74.2 −1.5	45.71 −.19	42.6 −0.5	32.54 −.16	45.5 0.0	61.35 −.17	56.3 +0.1
16.2	52.06 .63	72.5 2.0	45.52 .18	41.9 0.9	32.38 .15	45.4 −0.2	61.19 .16	56.2 −0.2
26.1	51.46 .57	70.2 2.4	45.35 .16	40.8 1.2	32.23 .14	45.1 0.5	61.04 .14	56.0 0.4
Oct. 6.1	50.92 .49	67.6 2.8	45.21 .13	39.4 1.6	32.11 .11	44.5 0.7	60.91 .11	55.5 0.6
16.1	50.48 .40	64.6 3.2	45.10 .09	37.6 1.9	32.01 .07	43.7 1.0	60.82 .08	54.8 0.8
26.0	50.14 −.28	61.3 −3.4	45.03 −.05	35.5 −2.2	31.96 −.03	42.6 −1.2	60.76 −.04	53.8 −1.1
Nov. 5.0	49.91 .16	57.7 3.6	45.01 .00	33.1 2.5	31.95 +.01	41.3 1.4	60.74 +.01	52.6 1.3
15.0	49.82 −.03	54.0 3.8	45.04 +.06	30.5 2.7	31.99 .06	39.7 1.7	60.78 .06	51.2 1.5
25.0	49.86 +.11	50.2 3.8	45.12 .11	27.7 2.9	32.08 .11	38.0 1.8	60.86 .11	49.5 1.7
Dec. 4.9	50.03 +.24	46.5 −3.7	45.26 +.16	24.8 −2.9	32.22 +.16	36.0 −2.0	60.99 +.15	47.7 −1.9
14.9	50.34 .37	42.9 3.5	45.44 .21	21.9 2.9	32.40 .20	34.0 2.1	61.17 .20	45.8 2.0
24.9	50.78 .49	39.6 3.2	45.67 .25	19.0 2.8	32.62 .24	31.9 2.1	61.39 .24	43.8 2.0
34.9	51.33 +.60	36.6 −2.7	45.94 +.28	16.3 −2.6	32.88 +.27	29.8 −2.1	61.64 +.27	41.8 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ursæ Minoris.		ε Coronæ Borealis.		δ Scorpii.		β^1 Scorpii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 15 48	° ′ +78 8	h m 15 52	° ′ +27 12	h m 15 53	° ′ −22 17	h m 15 58	° ′ −19 28
	s	″	s	″	s	″	s	″
(Dec. 30.9)	9.06 +.67	62.7 −3.0	44.08 +.26	58.1 −2.8	24.92 +.28	8.6 −0.7	38.00 +.27	56.8 −0.8
Jan. 9.9	9.81 .83	59.9 2.6	44.35 .28	55.5 2.5	25.22 .31	9.4 0.9	38.29 .30	57.7 1.0
19.8	10.70 .95	57.6 2.1	44.65 .30	53.1 2.2	25.54 .32	10.4 1.0	38.60 .32	58.7 1.1
29.8	11.71 1.04	55.8 1.5	44.96 .32	51.1 1.8	25.87 .33	11.4 1.1	38.92 .32	59.8 1.1
Feb. 8.8	12.78 1.10	54.6 0.8	45.28 .32	49.6 1.3	26.20 .33	12.4 1.1	39.25 .32	60.9 1.1
18.7	13.89 1.11	54.2 −0.1	45.60 +.32	48.5 −0.8	26.53 +.32	13.5 −1.1	39.57 +.32	61.9 −1.0
28.7	14.98 1.08	54.4 +0.5	45.91 .30	47.9 −0.3	26.85 .31	14.6 1.0	39.89 .31	62.9 0.9
Mar. 10.7	16.03 1.01	55.2 1.2	46.21 .28	47.9 +0.2	27.15 .30	15.5 0.9	40.19 .29	63.8 0.8
20.7	16.99 .91	56.7 1.8	46.48 .26	48.4 0.7	27.44 .27	16.4 0.8	40.47 .27	64.5 0.7
30.6	17.84 .78	58.8 2.3	46.73 .24	49.4 1.2	27.70 .25	17.2 0.7	40.73 .25	65.2 0.6
Apr. 9.6	18.54 +.63	61.3 +2.7	46.96 +.21	50.8 +1.6	27.94 +.23	17.8 −0.6	40.97 +.23	65.7 −0.5
19.6	19.09 .46	64.1 3.0	47.15 .18	52.6 1.9	28.15 .20	18.4 0.5	41.18 .20	66.1 0.3
29.6	19.46 .28	67.2 3.2	47.31 .14	54.6 2.2	28.34 .17	18.8 0.4	41.37 .17	66.4 0.2
May 9.5	19.64 +.09	70.5 3.3	47.43 .11	56.9 2.3	28.50 .14	19.2 0.3	41.53 .14	66.6 0.1
19.5	19.64 −.09	73.8 3.3	47.52 .07	59.2 2.4	28.62 .11	19.5 0.3	41.66 .11	66.7 −0.1
29.5	19.45 −.27	77.0 +3.1	47.58 +.04	61.6 +2.4	28.72 +.06	19.7 −0.2	41.76 +.08	66.7 0.0
June 8.4	19.10 .44	80.0 2.9	47.60 .00	64.0 2.3	28.78 .04	19.9 0.1	41.82 .05	66.7 0.0
18.4	18.58 .59	82.8 2.6	47.58 −.03	66.2 2.2	28.80 +.01	20.0 −0.1	41.85 +.01	66.6 +0.1
28.4	17.91 .73	85.2 2.2	47.53 .07	68.3 2.0	28.80 −.03	20.0 0.0	41.85 −.02	66.5 0.1
July 8.4	17.12 .85	87.3 1.8	47.45 .10	70.1 1.7	28.75 .06	20.0 +0.1	41.81 .06	66.4 0.2
18.3	16.21 −.95	88.9 +1.4	47.33 −.13	71.7 +1.4	28.67 −.09	19.9 +0.1	41.73 −.09	66.2 +0.2
28.3	15.22 1.03	90.0 0.9	47.19 .16	73.0 1.1	28.56 .12	19.7 0.2	41.63 .12	66.0 0.3
Aug. 7.3	14.16 1.08	90.6 +0.4	47.02 .18	73.9 0.8	28.43 .15	19.5 0.3	41.50 .14	65.7 0.3
17.3	13.07 1.11	90.7 −0.2	46.83 .19	74.5 +0.4	28.27 .16	19.2 0.4	41.35 .16	65.3 0.4
27.2	11.95 1.11	90.3 0.7	46.63 .20	74.7 0.0	28.10 .17	18.8 0.4	41.18 .17	64.9 0.4
Sept. 6.2	10.85 1.09	89.3 −1.2	46.43 −.20	74.6 −0.3	27.92 −.18	18.3 +0.5	41.00 −.17	64.5 +0.5
16.2	9.78 1.04	87.9 1.7	46.23 .19	74.0 0.7	27.75 .17	17.8 0.5	40.83 .16	64.0 0.5
26.1	8.78 .96	86.0 2.1	46.05 .17	73.1 1.1	27.59 .15	17.2 0.6	40.67 .15	63.6 0.5
Oct. 6.1	7.86 .86	83.6 2.6	45.88 .15	71.8 1.5	27.46 .12	16.6 0.6	40.54 .12	63.1 0.4
16.1	7.06 .73	80.9 2.9	45.75 .11	70.2 1.8	27.35 .08	16.1 0.5	40.43 .08	62.7 0.4
26.1	6.40 −.58	77.8 −3.2	45.66 −.07	68.2 −2.1	27.29 −.04	15.6 +0.4	40.37 −.04	62.4 +0.3
Nov. 5.0	5.90 .41	74.4 3.5	45.61 −.02	66.0 2.4	27.28 +.01	15.2 0.3	40.35 +.01	62.2 +0.1
15.0	5.58 .22	70.8 3.6	45.62 +.03	63.4 2.6	27.32 .07	15.0 +0.1	40.38 .06	62.2 0.0
25.0	5.45 −.03	67.1 3.7	45.67 .08	60.7 2.8	27.42 .12	15.0 −0.1	40.47 .11	62.3 −0.2
Dec. 5.0	5.52 +.18	63.4 −3.7	45.78 +.14	57.8 −2.9	27.56 +.17	15.2 −0.3	40.61 +.16	62.6 −0.4
14.9	5.80 .38	59.8 3.5	45.94 .19	54.9 2.9	27.76 .22	15.5 0.5	40.80 .21	63.1 0.6
24.9	6.27 .56	56.4 3.2	46.15 .23	52.0 2.8	28.00 .26	16.1 0.6	41.03 .25	63.8 0.8
34.9	6.93 +.74	53.4 −2.9	46.40 +.26	49.2 −2.7	28.28 +.29	16.8 −0.8	41.30 +.28	64.6 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.		δ Ophiuchi.		τ Herculis.		α Scorpii. (*Antares.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$16^{h}\ 5^{m}$	$+68^{\circ}\ 6'$	$16^{h}\ 8^{m}$	$-\ 3^{\circ}\ 23'$	$16^{h}\ 16^{m}$	$+46^{\circ}\ 35'$	$16^{h}\ 22^{m}$	$-26^{\circ}\ 10'$
	s	″	s	″	s	″	s	″
(Dec. 30.9)	56.83 +.38	57.9 −3.2	12.65 +.25	28.7 −1.6	12.14 +.26	26.9 −3.2	13.89 +.27	8.4 −0.4
Jan. 9.9	57.26 .47	54.8 2.8	12.91 .27	30.3 1.6	12.42 .30	23.8 2.9	14.17 .30	8.9 0.5
19.8	57.77 .54	52.2 2.4	13.20 .29	31.8 1.5	12.74 .34	21.1 2.5	14.48 .32	9.4 0.6
29.8	58.34 .60	50.1 1.8	13.49 .30	33.3 1.4	13.09 .36	18.9 2.0	14.81 .33	10.1 0.7
Feb. 8 8	58.96 .63	48.6 1.2	13.80 .30	34.6 1.2	13.46 .38	17.1 1.4	15.15 .34	10.9 0.8
18.8	59.59 +.64	47.8 −0.5	14.10 +.30	35.8 −1.0	13.84 +.38	16.0 −0.8	15.48 +.33	11.7 −0.8
28.7	60.23 .63	47.6 +0.2	14.39 .29	36.6 0.7	14.22 .37	15.5 −0.2	15.82 .33	12.5 0.8
Mar. 10.7	60.85 .61	48.2 0.9	14.68 .28	37.2 0.5	14.59 .36	15.6 +0.5	16.14 .32	13.3 0.8
20.7	61.42 .55	49.4 1.5	14.95 .26	37.5 −0.2	14.94 .33	16.4 1.0	16.44 .30	14.1 0.7
30.7	61.94 .49	51.1 2.0	15.20 .24	37.6 +0.1	15.26 .30	17.7 1.6	16.73 .28	14.8 0.7
Apr. 9.6	62.39 +.41	53.4 +2.5	15.42 +.22	37.4 +0.3	15.54 +.27	19.6 +2.1	17 00 +.26	15.4 −0.6
19.6	62.76 .33	56.1 2.9	15.63 .19	37.0 0.5	15.79 .23	21.9 2.5	17.25 .23	16.0 0.5
29.6	63.03 .23	59.1 3.1	15.81 .17	36.4 0.7	15.99 .18	24.5 2.8	17.47 .21	16.5 0.5
May 9.5	63.22 +.13	62.4 3.3	15.96 .14	35.6 0.8	16.15 .13	27.4 3.0	17.66 .18	17.0 0.4
19.5	63.30 +.04	65.7 3.3	16.09 .11	34.8 0.9	16.26 .09	30.4 3.1	17.82 .15	17.4 0.4
29.5	63.29 −.06	69.0 +3.3	16.18 +.08	33.9 +0.9	16.32 +.04	33.5 +3.1	17.95 +.11	17.7 −0.4
June 8.5	63.18 .15	72.2 3.1	16.24 .05	32.9 1.0	16.33 −.01	36.5 3.0	18.04 .07	18.1 0.3
18.4	62.98 .24	75 2 2.8	16.28 +.02	32.0 0.9	16.29 .06	39.4 2.8	18.09 +.04	18.4 0.3
28.4	62.70 .32	77.9 2.5	16.27 −.02	31.0 0.9	16.20 .11	42.1 2.5	18.11 .00	18.6 0.2
July 8.4	62.33 .40	80.2 2 2	16.24 .05	30.2 0.8	16.07 .15	44.4 2.2	18.09 −.04	18.8 0.2
18.4	61.90 −.46	82.2 +1.7	16.17 −.08	29.4 +0.8	15.90 −.19	46.5 +1.8	18.02 −.08	18.9 −0.1
28.3	61.41 .51	83.6 1.2	16.07 .11	28.7 0 7	15.69 .23	48.1 1.4	17.93 .11	19.0 0.0
Aug. 7.3	60.88 .55	84.6 0.7	15.95 .14	28.1 0.6	15.45 .26	49.4 1.0	17.80 .14	19.0 +0.1
17.3	60.31 .58	85.1 +0.2	15.80 .15	27.6 0.5	15.18 .28	50.1 0.6	17.64 .17	18.8 0.2
27.2	59.72 .59	85.1 −0.3	15.64 .16	27.2 0.4	14.89 .29	50.4 +0.1	17.47 .18	18.5 0.3
Sept. 6.2	59.12 −.59	84.5 −0.8	15.47 −.17	26.9 +0.2	14.60 −.29	50.3 −0.4	17.28 −.19	18.2 +0 4
16.2	58.54 .57	83.5 1.3	15.31 .16	26.8 +0.1	14.31 .29	49.6 0.9	17.09 .18	17.7 0.5
26.2	57.99 .53	81.9 1.8	15.15 .15	26.7 −0.1	14.03 .27	48.5 1.4	16.91 .17	17.2 0.6
Oct. 6.1	57.48 .48	79.8 2.3	15.01 .12	26.9 0.2	13.77 .24	46.9 1.8	16.76 .14	16.6 0.6
16.1	57.03 .41	77.3 2.7	14.90 .09	27.2 0.4	13.55 .20	44.9 2.2	16.63 .11	16.0 0.6
26.1	56.65 −.33	74.4 −3.0	14.83 −.05	27.7 −0.6	13.37 −.15	42.4 −2.6	16.54 −.06	15.4 +0.6
Nov. 5.1	56.37 .23	71.2 3.3	14.80 −.01	28.4 0.8	13.25 .10	39.6 2.9	16.50 −.02	14.8 0.5
15.0	56.18 .13	67.8 3.6	14.81 +.04	29.3 1.0	13.18 −.03	36.5 3.2	16.51 +.04	14.3 0.4
25.0	56.11 −.02	64.1 3.7	14.88 .09	30.4 1.3	13.18 +.03	33.2 3.4	16.58 .09	14.0 0.3
Dec. 5.0	56.15 +.10	60.4 −3.7	15.00 +.14	31.7 −1.4	13.24 +.10	29.8 −3.5	16.70 +.15	13.8 +0.1
14.9	56.31 .21	56.7 3.6	15.16 .18	33.1 1.5	13.37 .16	26.3 3.5	16.87 .20	13.8 −0.1
24.9	56.58 .32	53.1 3.4	15.36 .22	34.6 1.6	13.56 .22	22.8 3.4	17.09 .24	13.9 0.3
34.9	56.95 +.43	49.8 −3.1	15.60 +.25	36.2 −1.6	13.81 +.27	19.6 −3.2	17.35 +.28	14.3 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Draconis.		β Herculis.		A Draconis.		ζ Ophiuchi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$16^{h}\ 22^{m}$	$+61^{\circ}\ 46'$	$16^{h}\ 25^{m}$	$+21^{\circ}\ 44'$	$16^{h}\ 28^{m}$	$+69^{\circ}\ 0'$	$16^{h}\ 30^{m}$	$-10^{\circ}\ 19'$
	s	″	s	″	s	″	s	″
(Dec. 30.9)	22.09 +.30	38.6 −3.4	10.82 +.23	42.0 −2.6	9.42 +.34	69.4 −3.4	42.74 +.24	39.8 −1.1
Jan. 9.9	22.42 .37	35.4 3.0	11.07 .26	39.5 2.4	9.81 .44	66.2 3.0	43.00 .26	40.9 1.2
19.9	22.83 .43	32.6 2.6	11.34 .28	37.2 2.2	10.30 .52	63.4 2.6	43.27 .29	42.2 1.2
29.8	23.28 .47	30.2 2.0	11.62 .30	35.1 1.9	10.85 .59	61.0 2.0	43.57 .30	43.3 1.1
Feb. 8.8	23.77 .50	28.5 1.4	11.93 .31	33.4 1.5	11.47 .63	59.3 1.4	43.87 .31	44.4 1.0
18.8	24.28 +.52	27.4 −0.8	12.24 +.31	32.2 −1.0	12.11 +.66	58.2 −0.8	44.18 +.31	45.4 −0.9
28.7	24.80 .51	27.0 −0.1	12.54 .30	31.5 −0.5	12.77 .66	57.8 −0.1	44.48 .30	46.2 0.7
Mar. 10.7	25.31 .49	27.3 +0.6	12.84 .29	31.2 0.0	13.42 .64	58.0 +0.6	44.77 .29	46.8 0.5
20.7	25.78 .46	28.2 1.2	13.12 .27	31.4 +0.5	14.04 .60	59.0 1.2	45.06 .28	47.2 0.3
30.7	26.23 .42	29.7 1.8	13.38 .25	32.2 0.9	14.61 .54	60.5 1.8	45.32 .26	47.4 −0.1
Apr. 9.6	26.62 +.36	31.8 +2.3	13.62 +.23	33.3 +1.3	15.12 +.47	62.6 +2.3	45.57 +.24	47.4 +0.1
19.6	26.95 .30	34.3 2.7	13.84 .20	34.8 1.7	15.54 .38	65.1 2.7	45.80 .22	47.2 0.3
29.6	27.21 .23	37.2 3.0	14.02 .17	36.6 1.9	15.88 .29	68.0 3.0	46.01 .19	46.9 0.4
May 9.6	27.41 .16	40.3 3.2	14.18 .14	38.6 2.1	16.12 .19	71.2 3.2	46.18 .17	46.5 0.5
19.5	27.53 .08	43.6 3.3	14.31 .11	40.8 2.2	16.26 +.09	74.5 3.3	46.33 .14	45.9 0.6
29.5	27.57 +.01	46.9 +3.3	14.40 +.07	43.0 +2.2	16.30 −.01	77.9 +3.3	46.46 +.11	45.3 +0.6
June 8.5	27.54 −.07	50.2 3.2	14.46 +.04	45.3 2.2	16.24 .11	81.2 3.2	46.54 .07	44.7 0.6
18.4	27.44 .14	53.3 3.0	14.48 .00	47.5 2.1	16.07 .21	84.3 3.0	46.60 +.04	44.1 0.6
28.4	27.27 .21	56.1 2.7	14.46 −.03	49.5 2.0	15.82 .30	87.2 2.8	46.62 .00	43.5 0.6
July 8.4	27.03 .27	58.6 2.4	14.41 .07	51.4 1.8	15.48 .38	89.8 2.4	46.60 −.03	42.9 0.6
18.4	26.73 −.32	60.8 +2.0	14.33 −.10	53.1 +1.5	15.06 −.46	92.0 +2.0	46.55 −.07	42.4 +0.5
28.3	26.38 .37	62.6 1.5	14.21 .13	54.5 1.3	14.56 .52	93.7 1.5	46.47 .10	41.8 0.5
Aug. 7.3	25.98 .41	63.8 1.0	14.06 .16	55.6 1.0	14.02 .57	95.0 1.1	46.35 .13	41.4 0.4
17.3	25.56 .44	64.6 +0.5	13.89 .18	56.4 0.7	13.43 .61	95.8 0.6	46.21 .15	41.0 0.4
27.3	25.10 .46	64.9 0.0	13.71 .19	56.9 +0.3	12.82 .62	96.1 +0.1	46.05 .17	40.6 0.3
Sept. 6.2	24.64 −.46	64.6 −0.5	13.51 −.20	57.0 0.0	12.18 −.63	95.9 −0.5	45.88 −.17	40.3 +0.3
16.2	24.19 .45	63.8 1.0	13.31 .19	56.8 −0.4	11.56 .62	95.1 1.0	45.71 .17	40.0 0.2
26.2	23.75 .43	62.6 1.5	13.12 .18	56.3 0.7	10.95 .59	93.9 1.5	45.54 .16	39.9 +0.1
Oct. 6.1	23.34 .39	60.8 2.0	12.95 .16	55.4 1.1	10.38 .54	92.1 2.0	45.39 .14	39.8 0.0
16.1	22.97 .34	58.6 2.4	12.80 .13	54.1 1.4	9.87 .48	89.9 2.4	45.26 .11	39.8 −0.1
26.1	22.67 −.27	55.9 −2.8	12.69 −.09	52.5 −1.7	9.43 −.40	87.2 −2.8	45.18 −.07	40.0 −0.2
Nov. 5.1	22.43 .20	52.9 3.2	12.62 −.05	50.7 2.0	9.07 .30	84.2 3.2	45.13 −.02	40.2 0.4
15.0	22.27 .11	49.6 3.4	12.60 .00	48.5 2.3	8.82 .20	80.8 3.5	45.13 +.02	40.7 0.5
25.0	22.20 −.02	46.0 3.6	12.63 +.05	46.1 2.5	8.68 −.08	77.3 3.6	45.18 .07	41.3 0.7
Dec. 5.0	22.23 +.07	42.4 −3.7	12.71 +.10	43.5 −2.6	8.66 +.04	73.6 −3.7	45.28 +.12	42.1 −0.9
15.0	22.34 .16	38.7 3.7	12.84 .15	40.9 2.7	8.75 .16	69.9 3.7	45.42 .17	43.0 1.0
24.9	22.55 .25	35.1 3.5	13.01 .20	38.2 2.7	8.97 .27	66.3 3.5	45.61 .21	44.1 1.1
34.9	22.84 +.32	31.6 −3.3	13.23 +.23	35.5 −2.6	9.30 +.38	62.9 −3.3	45.84 +.24	45.3 −1.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Trianguli Australis.		*η* Herculis.		*κ* Ophiuchi.		*d* Herculis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 16 36	° ′ −68 48	h m 16 38	° ′ +39 8	h m 16 52	° ′ + 9 33	h m 16 57	° ′ +33 44
	s	″	s	″	s	″	s	″
(Dec. 30.9)	16.11 +.54	24.0 +1.9	51.98 +.22	40.5 −3.1	7.35 +.20	30.4 −2.1	16.23 +.20	17.4 −3.0
Jan. 9.9	16.69 .62	22.3 1.5	52.22 .26	37.5 2.9	7.57 .23	28.4 2.0	16.45 .24	14.4 2.8
19.9	17.35 .68	21.0 1.1	52.51 .30	34.7 2.6	7.82 .26	26.4 1.9	16.70 .27	11.8 2.5
29.8	18.06 .73	20.1 0.7	52.82 .32	32.3 2.1	8.08 .28	24.6 1.7	16.99 .29	9.4 2.2
Feb. 8.8	18.80 .76	19.6 +0.3	53.14 .34	30.4 1.6	8.37 .29	23.1 1.4	17.29 .31	7.4 1.7
18.8	19.57 +.77	19.5 −0.1	53.49 +.34	29.1 −1.1	8.66 +.29	21.9 −1.0	17.61 +.32	6.0 −1.2
28.8	20.34 .76	19.8 0.5	53.83 .34	28.3 −0.5	8.95 .29	21.1 0.6	17.94 .33	5.0 −0.6
Mar. 10.7	21.09 .74	20.6 0.9	54.17 .33	28.2 +0.1	9.24 .28	20.7 −0.2	18.26 .32	4.7 0.0
20.7	21.82 .71	21.6 1.2	54.50 .32	28.6 0.7	9.52 .27	20.6 +0.1	18.58 .31	4.9 +0.5
30.7	22.52 .67	23.0 1.6	54.80 .29	29.6 1.3	9.79 .26	21.0 0.4	18.87 .29	5.7 1.1
Apr. 9.6	23.16 +.62	24.8 −1.8	55.08 +.26	31.2 +1.8	10.04 +.24	21.6 +0.9	19.15 +.27	7.0 +1.5
19.6	23.75 .56	26.7 2.1	55.33 .23	33.1 2.2	10.27 .22	22.7 1.2	19.41 .24	8.8 2.0
29.6	24.27 .49	28.9 2.3	55.55 .20	35.5 2.5	10.48 .20	24.0 1.4	19.63 .21	11.0 2.3
May 9.6	24.72 .41	31.3 2.4	55.72 .16	38.2 2.7	10.66 .17	25.5 1.6	19.82 .18	13.4 2.6
19.5	25.08 .32	33.7 2.5	55.86 .12	41.0 2.9	10.82 .14	27.1 1.7	19.98 .14	16.1 2.7
29.5	25.36 +.23	36.3 −2.5	55.96 +.07	43.9 +2.9	10.94 +.11	28.9 +1.8	20.10 +.10	18.8 +2.8
June 8.5	25.54 .13	38.8 2.5	56.01 +.03	46.8 2.9	11.04 .08	30.6 1.8	20.18 .06	21.6 2.8
18.5	25.62 +.03	41.3 2.4	56.02 −.01	49.6 2.8	11.10 +.04	32.4 1.7	20.22 +.02	24.4 2.7
28.4	25.60 −.07	43.7 2.3	55.98 .06	52.3 2.6	11.12 .00	34.0 1.6	20.21 −.03	27.0 2.5
July 8.4	25.48 .17	45.8 2.1	55.90 .10	54.8 2.3	11.10 −.03	35.6 1.5	20.16 .07	29.4 2.3
18.4	25.26 −.26	47.8 −1.8	55.78 −.14	56.9 +2.0	11.06 −.07	37.0 +1.3	20.07 −.11	31.6 +2.0
28.3	24.96 .35	49.4 1.5	55.62 .18	58.7 1.6	10.97 .10	38.2 1.1	19.95 .15	33.5 1.7
Aug. 7.3	24.58 .42	50.7 1.1	55.42 .21	60.1 1.2	10.86 .13	39.2 0.9	19.78 .18	35.0 1.4
17.3	24.13 .47	51.6 0.6	55.20 .23	61.2 0.8	10.71 .15	40.0 0.7	19.59 .20	36.2 1.0
27.3	23.64 .51	52.0 −0.2	54.96 .25	61.7 +0.4	10.55 .17	40.6 0.5	19.37 .23	37.0 0.6
Sept. 6.2	23.12 −.52	51.9 +0.3	54.71 −.26	61.9 −0.1	10.37 −.18	40.9 +0.2	19.14 −.24	37.4 +0.1
16.2	22.60 .51	51.3 0.8	54.45 .25	61.6 0.5	10.18 .18	41.0 0.0	18.90 .24	37.3 −0.3
26.2	22.10 .48	50.3 1.2	54.20 .24	60.8 1.0	10.00 .18	40.8 −0.3	18.67 .23	36.8 0.7
Oct. 6.2	21.64 .43	48.9 1.7	53.96 .22	59.6 1.4	9.83 .16	40.4 0.6	18.45 .21	35.9 1.1
16.1	21.25 .35	47.0 2.0	53.76 .19	58.0 1.9	9.69 .13	39.7 0.8	18.25 .18	34.5 1.6
26.1	20.95 −.25	44.8 +2.3	53.59 −.15	55.9 −2.2	9.57 −.10	38.7 −1.1	18.08 −.15	32.8 −1.9
Nov. 5.1	20.76 .13	42.4 2.5	53.47 .10	53.5 2.6	9.49 .06	37.5 1.4	17.96 .10	30.6 2.3
15.0	20.69 −.01	39.8 2.6	53.39 −.04	50.8 2.9	9.46 −.01	36.0 1.6	17.88 −.05	28.2 2.6
25.0	20.74 +.12	37.2 2.6	53.38 +.02	47.8 3.1	9.47 +.04	34.3 1.8	17.85 .00	25.4 2.8
Dec. 5.0	20.92 +.24	34.6 +2.5	53.42 +.07	44.6 −3.3	9.53 +.09	32.4 −2.0	17.88 +.06	22.5 −3.0
15.0	21.22 .36	32.2 2.3	53.53 .13	41.2 3.3	9.64 .13	30.4 2.1	17.97 .11	19.4 3.1
24.9	21.64 .47	30.0 2.1	53.69 .19	38.0 3.3	9.80 .18	28.3 2.1	18.11 .16	16.3 3.1
34.9	22.16 +.57	28.1 +1.7	53.90 +.23	34.8 −3.1	10.00 +.21	26.2 −2.1	18.30 +.21	13.2 −2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Ursæ Minoris.		a¹ Herculis.		b Ophiuchi.		β Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 16 57	° ′ +82 13	h m 17 9	° ′ +14 31	h m 17 19	° ′ −24 3	h m 17 27	° ′ +52 23
	s	″	s	″	s	″	s	″
(Dec. 30.9)	48.28 +.52	36.3 −3.3	18.17 +.18	30.8 −2.3	13.14 +.21	51.6 −0.2	45.55 +.17	18.3 −3.4
Jan. 9.9	48.94 .80	33.1 3.1	18.38 .22	28.5 2.2	13.37 .25	51.8 0.2	45.75 .23	14.9 3.3
19.9	49.88 1.06	30.2 2.7	18.61 .25	26.4 2.0	13.64 .28	52.0 0.3	46.00 .28	11.7 3.0
29.9	51.06 1.28	27.8 2.2	18.87 .27	24.4 1.8	13.92 .31	52.4 0.4	46.31 .33	8.9 2.6
Feb. 8.8	52.44 1.46	25.8 1.6	19.15 .28	22.8 1.5	14.23 .31	52.8 0.4	46.66 .36	6.6 2.1
18.8	53.97 1.57	24.5 −1.0	19.44 +.29	21.5 −1.1	14.55 +.32	53.2 −0.4	47.04 +.39	4.8 −1.5
28.8	55.58 1.63	23.8 −0.4	19.73 .29	20.6 0.7	14.87 .32	53.6 0.4	47.44 .41	3.6 0.9
Mar. 10.7	57.22 1.62	23.7 +0.3	20.02 .29	20.2 −0.2	15.19 .32	53.9 0.3	47.85 .41	3.0 −0.2
20.7	58.81 1.56	24.3 0.9	20.31 .28	20.1 +0.2	15.51 .31	54.2 0.3	48.26 .40	3.2 +0.4
30.7	60.32 1.44	25.6 1.5	20.58 .27	20.6 0.6	15.82 .30	54.4 0.2	48.65 .38	3.9 1.1
Apr. 9.7	61.68 1.27	27.4 +2.0	20.84 +.25	21.4 +1.0	16.11 +.29	54.6 −0.1	49.02 +.36	5.2 +1.6
19.6	62.85 1.06	29.6 2.5	21.09 .23	22.6 1.3	16.40 .27	54.7 0.1	49.37 .33	7.2 2.2
29.6	63.79 .82	32.3 2.9	21.31 .21	24.0 1.6	16.66 .25	54.8 −0.1	49.67 .29	9.5 2.6
May 9.6	64.48 .56	35.3 3.1	21.51 .18	25.8 1.8	16.90 .23	54.8 0.0	49.94 .24	12.3 2.9
19.6	64.90 +.28	38.5 3.2	21.68 .15	27.7 2.0	17.11 .20	54.8 0.0	50.15 .19	15.4 3.1
29.5	65.03 .00	41.8 +3.3	21.82 +.12	29.7 +2.0	17.29 +.17	54.9 0.0	50.31 +.13	18.6 +3.3
June 8.5	64.88 −.29	45.1 3.3	21.92 .09	31.8 2.1	17.44 .13	54.9 −0.1	50.41 .07	21.9 3.3
18.5	64.46 .56	48.2 3.1	21.99 .05	33.8 2.0	17.55 .09	55.0 0.1	50.45 +.01	25.2 3.2
28.4	63.77 .81	51.2 2.9	22.03 +.01	35.8 1.9	17.62 .05	55.1 0.1	50.43 −.05	28.4 3.1
July 8.4	62.84 1.04	53.9 2.6	22.02 −.02	37.6 1.8	17.64 +.01	55.2 0.1	50.36 .11	31.4 2.9
18.4	61.69 1.25	56.3 +2.2	21.98 −.06	39.2 +1.6	17.63 −.04	55.3 −0.1	50.22 −.16	34.1 +2.6
28.4	60.35 1.43	58.3 1.8	21.90 .10	40.7 1.3	17.57 .08	55.4 0.1	50.03 .21	36.6 2.3
Aug. 7.3	58.84 1.58	59.9 1.3	21.79 .13	41.9 1.1	17.48 .11	55.5 −0.1	49.79 .26	38.6 1.9
17.3	57.21 1.69	61.0 0.9	21.64 .15	42.9 0.8	17.35 .15	55.5 0.0	49.51 .30	40.2 1.4
27.3	55.48 1.76	61.6 +0.4	21.48 .18	43.6 0.6	17.19 .17	55.5 +0.1	49.20 .33	41.4 0.9
Sept. 6.3	53.70 1.80	61.7 −0.1	21.29 −.19	44.0 +0.3	17.01 −.19	55.4 +0.1	48.86 −.35	42.1 +0.4
16.2	51.90 1.79	61.3 0.6	21.10 .19	44.2 0.0	16.82 .19	55.2 0.2	48.50 .36	42.3 0.0
26.2	50.13 1.74	60.4 1.1	20.91 .19	44.0 −0.3	16.62 .19	55.0 0.3	48.15 .35	42.0 −0.6
Oct. 6.2	48.43 1.65	59.1 1.6	20.73 .17	43.5 0.6	16.44 .17	54.7 0.3	47.80 .34	41.2 1.1
16.1	46.84 1.52	57.2 2.1	20.57 .15	42.8 0.9	16.28 .15	54.4 0.3	47.48 .31	39.9 1.6
26.1	45.40 1.34	54.9 −2.5	20.43 −.12	41.7 −1.2	16.15 −.11	54.0 +0.4	47.18 −.27	38.1 −2.0
Nov. 5.1	44.16 1.13	52.2 2.9	20.34 .07	40.3 1.5	16.06 .07	53.6 0.4	46.94 .22	35.8 2.5
15.1	43.16 .88	49.2 3.2	20.28 −.03	38.7 1.8	16.02 −.02	53.3 0.3	46.75 .16	33.2 2.8
25.0	42.42 .60	46.0 3.4	20.28 +.02	36.8 2.0	16.02 +.03	53.0 0.2	46.63 .09	30.2 3.1
Dec. 5.0	41.96 −.30	42.5 −3.5	20.32 +.07	34.7 −2.2	16.08 +.08	52.9 +0.1	46.57 −.02	26.9 −3.4
15.0	41.82 +.01	39.0 3.5	20.41 .11	32.5 2.3	16.19 .14	52.8 0.0	46.58 +.05	23.4 3.5
25.0	41.99 .33	35.4 3.5	20.54 .16	30.2 2.3	16.35 .18	52.9 −0.1	46.67 .12	19.9 3.5
34.9	42.47 +.63	32.0 −3.3	20.72 +.20	27.9 −2.3	16.56 +.22	53.0 −0.2	46.83 +.19	16.4 −3.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ophiuchi.		ω Draconis.		μ Herculis.		ψ¹ Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$17^h\,29^m$	$+12^\circ\,38'$	$17^h\,37^m$	$+68^\circ\,48'$	$17^h\,41^m$	$+27^\circ\,47'$	$17^h\,43^m$	$+72^\circ\,12'$
	s	″	s	″	s	″	s	″
Jan. 0.0	29.62 +.17	49.4 -2.1	34.44 +.17	43.5 -3.6	51.94 +.14	26.1 -2.8	56.52 +.15	22.4 -3.6
9.9	29.80 .20	47.2 2.1	34.66 .28	40.0 3.4	52.10 .19	23.3 2.7	56.74 .28	18.9 3.4
19.9	30.02 .23	45.2 2.0	34.98 .38	36.8 3.1	52.31 .22	20.6 2.5	57.08 .41	15.6 3.1
29.9	30 27 .26	43.3 1.7	35.40 .47	33.9 2.7	52.55 .25	18.2 2.2	57.55 .52	12.6 2.8
Feb. 8.8	30.53 .27	41.7 1.5	35.91 .54	31.4 2.2	52.82 .28	16.2 1.9	58.12 .61	10.1 2.3
18.8	30.81 +.28	40.4 -1.1	36.48 +.59	29.5 -1.6	53.11 +.29	14.5 -1.4	58.77 +.68	8.2 -1.7
28.8	31.10 .29	39.5 0.7	37.10 .63	28.2 1.0	53.40 .30	13.4 0.9	59.48 .73	6.8 1.0
Mar. 10.8	31.39 .29	39.0 -0.3	37.74 .65	27.6 -0.3	53.71 .30	12.7 -0.4	60.22 .75	6.1 -0.4
20.7	31.68 .28	38.9 +0.1	38.38 .64	27.6 +0.4	54.01 .30	12.6 +0.2	60.97 .75	6.0 +0.3
30.7	31.96 .27	39.2 0.5	39.02 .61	28.4 1.0	54.31 .29	13.1 0.7	61.71 .72	6.7 0.9
Apr. 9.7	32.22 +.26	40.0 +0.9	39.61 +.57	29.7 +1.6	54.60 +.28	14.0 +1.2	62.41 +.67	7.9 +1.6
19.7	32.48 .25	41.1 1.3	40.15 .51	31.6 2.2	54.88 .26	15.4 1.6	63.05 .61	9.8 2.1
29.6	32.72 .22	42.5 1.5	40.63 .44	34.0 2.6	55.13 .24	17.2 2.0	63.62 .52	12.1 2.6
May 9.6	32.93 .20	44.2 1.7	41.03 .36	36.9 3.0	55.36 .21	19.4 2.3	64.09 .42	14.9 2.9
19.6	33.12 .17	46.0 1.9	41.34 .26	40.0 3.2	55.56 .18	21.8 2.5	64.45 .31	18.0 3.2
29.5	33.27 +.14	47.9 +2.0	41.55 +.16	43.3 +3.4	55.72 +.15	24.3 +2.6	64.70 +.19	21.2 +3.3
June 8.5	33.40 .11	50.0 2.0	41.66 +.06	46.8 3.4	55.85 .10	27.0 2.7	64.84 +.07	24.6 3.4
18.5	33.49 .07	52.0 2.0	41.68 -.04	50.2 3.4	55.94 .07	29.6 2.7	64.85 -.05	28.0 3.4
28.5	33.55 +.03	53.9 1.9	41.58 .14	53.6 3.3	55.99 +.03	32.3 2.5	64.73 .17	31.4 3.3
July 8.4	33.56 -.01	55.7 1.7	41.39 .24	56.7 3.1	55.99 -.02	34.7 2.4	64.50 .29	34.6 3.1
18.4	33.54 -.04	57.4 +1.6	41.10 -.33	59.6 +2.8	55.96 -.06	37.0 +2.2	64.16 -.40	37.5 +2.8
28.4	33.47 .08	58.8 1.4	40.72 .42	62.2 2.4	55.88 .10	39.0 1.9	63.71 .50	40.1 2.4
Aug. 7.4	33.37 .12	60.1 1.1	40.27 .49	64.4 2.0	55.76 .14	40.8 1.6	63.17 .58	42.4 2.1
17.3	33.24 .14	61.1 0.9	39.75 .55	66.2 1.6	55.60 .17	42.2 1.3	62.55 .66	44.2 1.6
27.3	33.08 .17	61.9 0.6	39.17 .60	67.5 1.1	55.42 .20	43.3 0.9	61.86 .71	45.6 1.2
Sept. 6.3	32.91 -.18	62.4 +0.4	38.56 -.63	68.4 +0.6	55.21 -.21	44.0 +0.5	61.12 -.75	46.5 +0.7
16.2	32.72 .19	62.6 +0.1	37.92 .65	68.7 +0.1	54.99 .22	44.4 +0.1	60.36 .77	46.9 +0.1
26.2	32.53 .19	62.6 -0.2	37.27 .64	68.5 -0.5	54.77 .22	44.3 -0.3	59.58 .77	46.8 -0.4
Oct. 6.2	32.34 .18	62.2 0.5	36.64 .62	67.7 1.0	54.55 .21	43.8 0.7	58.81 .75	46.1 0.9
16.2	32.17 .16	61.6 0.8	36.03 .58	66.5 1.5	54.34 .19	42.9 1.1	58.08 .71	44.9 1.4
26.1	32.03 -.13	60.6 -1.1	35.48 -.53	64.7 -2.0	54.16 -.16	41.7 -1.5	57.40 -.65	43.2 -1.9
Nov. 5.1	31.92 .09	59.5 1.3	34.99 .45	62.4 2.5	54.02 .13	40.0 1.8	56.79 .56	41.0 2.4
15.1	31.85 -.05	58.0 1.6	34.58 .36	59.8 2.9	53.92 .08	38.1 2.1	56.28 .46	38.4 2.8
25.1	31.83 .00	56.3 1.8	34.26 .26	56.7 3.2	53.86 -.03	35.8 2.4	55.87 .34	35.4 3.1
Dec. 5.0	31.86 +.05	54.4 -2.0	34.06 -.15	53.4 -3.4	53.85 +.02	33.2 -2.6	55.59 -.21	32.2 -3.4
15.0	31.93 .10	52.3 2.1	33.97 -.03	49.9 3.6	53.89 .07	30.5 2.8	55.45 -.08	28.7 3.6
25.0	32.04 .14	50.2 2.2	34.00 +.09	46.3 3.6	53.98 .12	27.6 2.9	55.44 +.06	25.1 3.6
34.9	32.20 +.18	47.9 -2.4	34.15 +.21	42.7 -3.5	54.12 +.16	24.8 -2.8	55.57 +.20	21.5 -3.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Draconis.		γ^2 Sagittarii.		μ Sagittarii.		η Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 17 53	+51° 29′	h m 17 58	−30° 25′	h m 18 6	−21° 5′	h m 18 15	− 2° 55′
	s	″	s	″	s	″	s	″
Jan. 0.0	51.59 +.12	73.6 −3.4	17.01 +.18	19.5 +0.4	45.50 +.16	10.6 −0.1	14.84 +.14	34.6 −1.2
9.9	51.74 .19	70.2 3.3	17.21 .22	19.1 0.3	45.68 .20	10.8 0.2	15.00 .17	35.9 1.2
19.9	51.96 .25	66.9 3.1	17.45 .26	18.8 0.3	45.90 .23	11.0 0.2	15.18 .20	37.1 1.2
29.9	52.23 .30	64.0 2.7	17.72 .29	18.6 0.2	46.14 .26	11.2 0.2	15.40 .23	38.2 1.1
Feb. 8.9	52.55 .34	61.4 2.3	18.02 .31	18.5 0.1	46.41 .28	11.4 0.2	15.64 .25	39.2 0.9
18.8	52.90 +.37	59.4 −1.7	18.34 +.32	18.4 +0.1	46.70 +.29	11.5 −0.1	15.90 +.26	40.0 −0.7
28.8	53.28 .39	58.0 1.2	18.67 .33	18.3 +0.1	47.00 .30	11.6 −0.1	16.17 .28	40.6 0.5
Mar. 10.8	53.68 .40	57.2 −0.5	19.00 .34	18.2 0.0	47.31 .31	11.6 0.0	16.45 .28	40.9 −0.2
20.8	54.08 .40	57.0 +0.2	19.34 .34	18.2 0.0	47.62 .31	11.6 +0.1	16.73 .29	41.0 +0.1
30.7	54.47 .39	57.5 0.8	19.67 .33	18.1 0.0	47.93 .31	11.4 0.2	17.02 .28	40.7 0.4
Apr. 9.7	54.86 +.37	58.6 +1.4	20.00 +.32	18.1 0.0	48.23 +.30	11.2 +0.3	17.30 +.28	40.3 +0.6
19.7	55.22 .35	60.2 1.9	20.32 .31	18.1 0.0	48.53 .29	10.9 0.3	17.58 .27	39.5 0.9
29.6	55.55 .31	62.4 2.4	20.62 .29	18.1 −0.1	48.82 .28	10.5 0.4	17.84 .26	38.6 1.0
May 9.6	55.84 .27	65.0 2.8	20.90 .27	18.2 0.1	49.08 .26	10.1 0.4	18.09 .24	37.4 1.2
19.6	56.08 .22	68.0 3.1	21.16 .24	18.3 0.2	49.33 .23	9.8 0.4	18.32 .22	36.2 1.3
29.6	56.28 +.17	71.1 +3.2	21.39 +.21	18.5 −0.2	49.55 +.20	9.4 +0.4	18.52 +.19	34.9 +1.3
June 8.5	56.42 .11	74.4 3.3	21.58 .18	18.8 0.3	49.74 .17	9.1 0.3	18.70 .16	33.6 1.3
18.5	56.50 +.05	77.8 3.3	21.74 .14	19.1 0.4	49.89 .13	8.8 0.2	18.84 .12	32.3 1.3
28.5	56.52 −.01	81.1 3.2	21.85 .09	19.5 0.4	50.00 .09	8.6 0.2	18.95 .09	31.0 1.2
July 8.4	56.48 .07	84.2 3.1	21.92 +.04	19.9 0.4	50.08 +.05	8.5 +0.1	19.01 +.05	29.9 1.1
18.4	56.38 −.13	87.2 +2.8	21.94 .00	20.4 −0.5	50.10 .00	8.4 0.0	19.04 .00	28.8 +1.0
28.4	56.23 .18	89.8 2.5	21.91 −.05	20.8 0.5	50.09 −.04	8.4 0 0	19.02 −.04	27.9 0.9
Aug. 7.4	56.02 .23	92.1 2.1	21.84 .09	21.3 0.4	50.03 .08	8.4 0.0	18.97 .08	27.1 0.7
17.3	55.77 .27	94.0 1.7	21.72 .13	21.7 0.4	49.93 .12	8.5 −0.1	18.87 .11	26.4 0.6
27.3	55.48 .31	95.6 1.3	21.57 .17	22.0 0.3	49.79 .15	8.6 −0.1	18.75 .14	26.0 0.4
Sept. 6.3	55.15 −.33	96.6 +0.8	21.39 −.19	22.2 −0.2	49.63 −.17	8.6 0.0	18.59 −.16	25.6 +0.3
16.3	54.81 .35	97.1 +0.3	21.20 .20	22.3 0.0	49.45 .19	8.6 0.0	18.42 .18	25.4 +0.1
26.2	54.46 .35	97.2 −0.2	20.99 .21	22.3 +0.1	49.26 .19	8.6 0.0	18.24 .18	25.3 0.0
Oct. 6.2	54.12 .34	96.7 0.7	20.78 .20	22.1 0.2	49.07 .18	8.5 +0.1	18.06 .18	25.4 −0.2
16.2	53.78 .32	95.7 1.2	20.60 .18	21.8 0.4	48.89 .17	8.4 0.1	17.88 .16	25.6 0.3
26.1	53.48 −.29	94.2 −1.7	20.43 −.15	21.4 +0.5	48.73 −.14	8.3 +0.1	17.73 −.15	26.0 −0.5
Nov. 5.1	53.22 .24	92.3 2.2	20.30 .11	20.9 0.5	48.61 .10	8.2 0.1	17.60 .11	26.6 0.6
15.1	53.01 .19	89.9 2.6	20.22 .06	20.3 0 6	48.53 .06	8.1 0.1	17.52 .07	27.3 0.8
25.1	52.85 .12	87.1 2.9	20.19 −.01	19.7 0.6	48.49 −.01	8.0 +0.1	17.47 −.03	28.1 0.9
Dec. 5.0	52.76 −.06	84.0 −3.2	20.21 +.05	19.1 +0.6	48.50 +.03	8.0 0.0	17.46 +.02	29.1 −1.0
15.0	52.74 +.01	80.7 3.4	20.28 .10	18.6 0.5	48.56 .08	8.0 −0.1	17.50 .06	30.2 1.1
25.0	52.78 .08	77.2 3.5	20.40 .15	18.1 0.5	48.67 .13	8.0 0.1	17.59 .10	31.4 1.2
35.0	52.90 +.14	73.8 −3.5	20.58 +.20	17.7 +0.4	48.82 +.17	8.2 −0.2	17.71 +.14	32.6 −1.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Octantis.		1 Aquilæ.		α Lyræ. (*Vega.*)		β Lyræ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h 18	° ′ −89 15	h m 18 28	° ′ − 8 19	h m 18 32	° ′ +38 40	h m 18 45	° ′ +33 13
	m s	″	s	″	s	″	s	″
Jan. 0.0	28 32.3+ 4.8	75.2 +3.4	49 91 + 13	23.2 −0.9	57.50 +.08	37.3 −3.1	44.66 +.08	45.7 −2.9
10.0	28 38.8 8.1	71.8 3.3	50.06 .16	24.1 0.9	57.60 .13	34.3 3.1	44.76 .12	42.8 2.9
19.9	28 48.3 10.9	68.7 3.0	50.24 .20	24.9 0.8	57.76 .18	31.3 2.9	44.90 .16	40.0 2.8
29.9	29 0.5 13.4	65.8 2.7	50.45 .22	25.7 0.7	57.96 .22	28.5 2.7	45.09 .20	37.3 2.5
Feb. 8.9	29 15.0 15.6	63.2 2.4	50.68 .25	26.4 0.6	58.20 .26	26.0 2.3	45.31 .23	34.9 2.1
18.9	29 31.6+17.4	61.0 +2.0	50.94 +.26	27.0 −0.5	58.47 +.29	23.8 −1.9	45.56 +.26	32.9 −1.8
28.8	29 49.6 18.7	59.3 1.5	51.21 .28	27.3 0.3	58.77 .31	22.3 1.3	45.83 .29	31.3 1.3
Mar. 10.8	30 8.7 19.5	58.1 1.0	51.49 .28	27.5 −0.1	59.09 .32	21.2 0.8	46.13 .30	30.2 0.8
20.8	30 28.5 19.9	57.3 0.5	51.78 .29	27.4 +0.2	59.42 .33	20.7 −0.2	46.44 .31	29.7 −0.2
30.7	30 48.4 19.9	57.0 +0.1	52.07 .29	27.2 0.4	59.75 .33	20.9 +0.4	46.75 .32	29.8 +0.3
Apr. 9.7	31 8.1+19.4	57.2 −0.4	52.36 +.29	26.7 +0.6	60.08 +.33	21.6 +1.0	47.06 +.32	30.4 +0.9
19.7	31 27.2 18.6	57.8 0.9	52.64 .28	26.0 0.8	60.41 .32	22.8 1.5	47.38 .31	31.5 1.4
29.7	31 45.3 17.4	58.9 1.3	52.92 .27	25.2 0.9	60.72 .30	24.6 2.0	47.68 .29	33.2 1.9
May 9.6	32 1.9 15.9	60.5 1.8	53.18 .25	24.2 1.0	61.00 .27	26.8 2.4	47.96 .27	35.2 2.2
19.6	32 16.9 14.0	62.4 2.2	53.42 .23	23.1 1.1	61.26 .24	29.4 2.7	48.22 .24	37.6 2.5
29.6	32 29.8+11.7	64.7 −2 5	53.64 +.21	22.0 +1.1	61.48 +.20	32.2 +2.9	48.45 +.21	40.3 +2.8
June 8.6	32 40.3 9.3	67.3 2.7	53.84 .18	21.0 1.1	61.67 .16	35.2 3.1	48.65 .17	43.2 2.9
18.5	32 48.2 6.5	70.1 2.8	54.00 .14	19.9 1.0	61.81 .12	38.4 3.1	48.80 .13	46.2 3.0
28.5	32 53.3 3.6	73.0 3.0	54.12 .10	18.9 1.0	61.90 .07	41.5 3.1	48.91 .09	49.1 3.0
July 8.5	32 55.4+ 0.6	76.1 3.0	54.21 .06	18.0 0.9	61.94 +.02	44.6 3.0	48.98 +.04	52.0 2.9
18.4	32 54.5− 2.4	79.1 −2.9	54.25 +.02	17.2 +0.8	61.94 −.03	47.5 +2.8	48.99 −.01	54.8 +2.7
28.4	32 50.6 5.4	81.9 2.7	54.25 −.02	16 5 0.6	61.88 .08	50.2 2.6	48.96 .06	57.4 2.5
Aug. 7.4	32 43.7 8.2	84.6 2.5	54.20 .06	15.9 0.5	61.77 .13	52.6 2.3	48.88 .10	59.8 2.2
17.4	32 34.2 10.8	87.0 2.2	54.12 .10	15.5 0.4	61.62 .17	54.7 1.9	48.76 .14	61.9 1.9
27.3	32 22.2 13.0	89.0 1.8	54.00 .13	15.1 0.3	61.43 .21	56.5 1.5	48.60 .18	63.6 1.6
Sept. 6.3	32 8.3−14.8	90.6 −1.3	53.86 −.16	14.9 +0.2	61.21 −.23	57.8 +1.1	48.40 −.21	65.0 +1.2
16.3	31 52.8 16.0	91.6 0.8	53.69 .17	14.8 +0.1	60.96 .25	58.8 0.7	48.18 .23	65.9 0.8
26.3	31 36.4 16.7	92.1 −0.2	53.51 .18	14.7 0.0	60.70 .26	59.2 +0.2	47.95 .24	66.5 +0.3
Oct. 6.2	31 19.7 16.7	92.0 +0.4	53.33 .18	14.8 −0.1	60.44 .26	59.3 −0.2	47.71 .24	66.6 −0.1
16.2	31 3.3 16.0	91.2 1.0	53.15 .17	15.0 0.2	60.18 .25	58.8 0.7	47.47 .23	66.3 0.5
26.2	30 47.9−14.7	89.9 +1.6	53.00 −.14	15.2 −0.3	59.94 −.23	57.9 −1.2	47.25 −.21	65.5 −1.0
Nov. 5.1	30 34.1 12.7	88.0 2.1	52.86 .11	15.6 0.4	50.73 .20	56.5 1.6	47.05 .18	64.3 1.4
15.1	30 22.6 10.3	85.7 2.6	52.77 .08	16.0 0.5	59.55 .16	54.7 2.0	46.89 .15	62.7 1.8
25.1	30 13.7 7.4	82.9 3.0	52.71 −.04	16.6 0.6	59.42 .11	52.5 2.4	46.76 .10	60.8 2.2
Dec. 5.1	30 7.9− 4.2	79.8 +3.2	52.70 +.01	17.2 −0.7	59.33 −.06	50.0 −2.7	46.68 −.06	58.4 −2.5
15.0	30 5.4− 0.8	76.5 3.4	52.73 .05	18.0 0.8	59.30 −.01	47.1 2.9	46.64 −.01	55.8 2.7
25.0	30 6.3+ 2.6	73.0 3.4	52.81 .10	18.8 0.8	59.32 +.05	44.1 3.1	46.66 +.04	53.0 2.8
35.0	30 10.5+ 6.0	69.6 +3.3	52 93 +.14	19.6 −0.9	59.40 +.10	41.0 −3.1	46.73 +.08	50.1 −2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*σ* Sagittarii.		50 Draconis.		*ζ* Aquilæ.		*d* Sagittarii.	
	Right Ascension.	**Declination** *South.*	**Right Ascension.**	**Declination** *North.*	**Right Ascension.**	**Declination** *North.*	**Right Ascension.**	**Declination** *South.*
	h m 18 48	° ′ −26 26	h m 18 50	° ′ +75 17	h m 19 0	° ′ +13 41	h m 19 10	° ′ −19 9
	s	″	s	″	s	″	s	″
Jan. 0.0	0.05 +.12	20.5 +0.4	2.92 −.09	51.7 −3.4	1.34 +.08	32.6 −2.0	46.81 +.09	29.9 −0.1
10.0	0.19 .17	20.2 0.3	2.91 +.08	48.2 3.5	1.44 .12	30.6 2.0	46.92 .13	30.0 0.0
20.0	0.38 .20	19.8 0.3	3.07 .24	44.8 3.4	1.57 .15	28.6 1.9	47.07 .16	30.0 0.0
29.9	0.60 .23	19.5 0.3	3.39 .40	41.5 3.2	1.74 .18	26.7 1.8	47.26 .20	30.0 0.0
Feb. 8.9	0.84 .26	19.2 0.3	3.86 .54	38.5 2.8	1.94 .21	25.1 1.5	47.47 .23	30.0 +0.1
18.9	1.11 +.28	18.8 +0.4	4.47 +.66	35.9 −2.4	2.16 +.23	23.7 −1.2	47.71 +.25	29.8 +0.2
28.8	1.40 .30	18.5 0.4	5.18 .76	33.8 1.8	2.41 .25	22.6 0.9	47.97 .27	29.6 0.3
Mar. 10.8	1.71 .31	18.1 0.4	5.98 .83	32.2 1.2	2.67 .27	22.0 0.5	48.24 .28	29.2 0.4
20.8	2.02 .32	17.7 0.5	6.84 .88	31.3 −0.6	2.95 .28	21.7 −0.1	48.53 .30	28.8 0.5
30.8	2.34 .32	17.2 0.5	7.73 .89	31.1 +0.1	3.23 .29	21.8 +0.4	48.83 .30	28.2 0.6
Apr. 9.7	2.66 +.32	16.7 +0.5	8.62 +.88	31.5 +0.7	3.52 +.29	22.4 +0.8	49.14 +.31	27.6 +0.7
19.7	2.98 .32	16.2 0.5	9.48 .83	32.6 1.4	3.81 .28	23.4 1.2	49.44 .31	26.9 0.8
29.7	3.30 .31	15.7 0.5	10.28 .77	34.2 1.9	4.09 .28	24.7 1.5	49.75 .30	26.0 0.8
May 9.7	3.60 .30	15.2 0.4	11.00 .68	36.4 2.4	4.36 .26	26.4 1.8	50.04 .29	25.2 0.8
19.6	3.89 .27	14.8 0.4	11.62 .56	39.0 2.8	4.61 .24	28.3 2.0	50.33 .27	24.3 0.8
29.6	4.15 +.25	14.5 +0.3	12.12 +.44	42.0 +3.1	4.84 +.22	30.3 +2.1	50.59 +.25	23.5 +0.8
June 8.6	4.38 .22	14.3 0.2	12.49 .30	45.2 3.3	5.05 .19	32.5 2.2	50.83 .22	22.8 0.7
18.5	4.58 .18	14.2 +0.1	12.72 .16	48.6 3.5	5.22 .16	34.8 2.2	51.04 .19	22.2 0.6
28.5	4.74 .14	14.1 0.0	12.81 +.01	52.1 3.5	5.36 .12	37.0 2.2	51.21 .15	21.6 0.5
July 8.5	4.86 .09	14.2 −0.1	12.74 −.14	55.6 3.4	5.45 .07	39.2 2.1	51.34 .11	21.2 0.3
18.5	4.92 +.04	14.4 −0.2	12.53 −.28	59.0 +3.3	5.51 +.03	41.2 +2.0	51.43 +.06	21.0 +0.2
28.4	4.94 .00	14.7 0.3	12.17 .42	62.2 3.1	5.52 −.01	43.1 1.8	51.47 +.02	20.8 +0.1
Aug. 7.4	4.92 −.05	15.0 0.4	11.69 .55	65.1 2.8	5.48 .05	44.8 1.6	51.46 −.03	20.7 0.0
17.4	4.84 .09	15.4 0.4	11.08 .66	67.8 2.5	5.41 .09	46.3 1.3	51.41 .07	20.8 −0.1
27.4	4.73 .13	15.8 0.4	10.37 .76	70.0 2.1	5.30 .13	47.5 1.1	51.32 .11	20.9 0.2
Sept. 6.3	4.58 −.16	16.1 −0.3	9.57 −.84	71.9 +1.7	5.15 −.16	48.4 +0.8	51.19 −.14	21.1 −0.2
16.3	4.40 .18	16.4 0.3	8.70 .90	73.3 1.2	4.98 .18	49.1 0.5	51.04 .17	21.3 0.2
26.3	4.21 .20	16.6 0.2	7.78 .93	74.2 0.7	4.80 .19	49.5 +0.2	50.86 .18	21.5 0.2
Oct. 6.2	4.01 .20	16.8 −0.1	6.84 .94	74.7 +0.2	4.61 .19	49.6 −0.1	50.67 .19	21.7 0.2
16.2	3.82 .19	16.8 0.0	5.90 .93	74.5 −0.4	4.42 .19	49.4 0.4	50.49 .18	21.9 0.2
26.2	3.64 −.17	16.7 +0.1	4.99 −.89	73.8 −0.9	4.24 −.17	48.9 −0.7	50.31 −.16	22.0 −0.1
Nov. 5.2	3.49 .13	16.6 0.2	4.13 .83	72.7 1.5	4.08 .14	48.1 0.9	50.16 .14	22.1 0.1
15.1	3.37 .10	16.4 0.3	3.34 .74	70.9 2.0	3.95 .11	47.0 1.2	50.04 .11	22.2 0.1
25.1	3.30 .05	16.1 0.3	2.65 .63	68.7 2.5	3.86 .08	45.6 1.5	49.95 .07	22.3 0.1
Dec. 5.1	3.27 −.01	15.7 +0.3	2.08 −.50	66.1 −2.8	3.80 −.04	44.1 −1.7	49.90 −.02	22.4 −0.1
15.1	3.29 +.04	15.4 0.3	1.66 .35	63.0 3.2	3.79 +.01	42.3 1.9	49.90 +.02	22.4 0.1
25.0	3.36 .09	15.1 0.3	1.38 .19	59.8 3.4	3.82 .05	40.4 2.0	49.94 .06	22.5 0.1
35.0	3.47 +.13	14.7 +0.3	1.27 −.03	56.3 −3.5	3.89 +.09	38.3 −2.0	50.03 +.10	22.6 −0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis.		τ Draconis.		δ Aquilæ.		κ Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 12	° ′ +67 27	h m 19 17	° ′ +73 8	h m 19 19	° ′ + 2 52	h m 19 30	° ′ − 7 16
	s	″	s	″	s	″	s	″
Jan. 0.0	28.36 −.07	31.1 −3.4	43.42 −.15	27.6 −3.4	35.43 +.07	63.8 −1.4	35.31 +.07	65.2 −0.7
10.0	28.35 +.04	27.6 3.5	43.34 −.01	24.2 3.4	35.52 .11	62.4 1.4	35.40 .10	65.9 0.7
20.0	28.44 .14	24.2 3.4	43.40 +.14	20.7 3.4	35.64 .14	61.1 1.3	35.52 .14	66.6 0.7
29.9	28.63 .24	20.8 3.2	43.61 .28	17.3 3.3	35.79 .17	59.8 1.2	35.67 .17	67.3 0.6
Feb. 8.9	28.92 .34	17.7 3.0	43.95 .41	14.2 3.0	35.98 .20	58.7 1.0	35.85 .20	67.8 0.4
18.9	29.31 +.43	14.9 −2.5	44.42 +.52	11.4 −2.6	36.19 +.22	57.8 −0.8	36.06 +.22	68.2 −0.3
28.9	29.77 .50	12.6 2.0	44.99 .62	9.0 2.1	36.42 .24	57.2 0.5	36.29 .24	68.4 −0.1
Mar. 10.8	30.29 .55	10.9 1.5	45.65 .70	7.2 1.5	36.67 .26	56.8 −0.2	36.54 .26	68.3 +0.1
20.8	30.86 .59	9.7 0.8	46.38 .75	5.9 0.9	36.94 .27	56.8 +0.1	36.80 .27	68.1 0.4
30.8	31.46 .61	9.2 −0.2	47.15 .78	5.3 −0.3	37.22 .28	57.1 0.4	37.08 .28	67.6 0.6
Apr. 9.7	32.08 +.61	9.4 +0.5	47.94 +.79	5.4 +0.4	37.50 +.29	57.7 +0 8	37.37 +.29	66.9 +0.8
19.7	32.68 .59	10.2 1.1	48.72 .76	6.1 1.0	37.79 .29	58.6 1.0	37.66 .29	66.0 1.0
29.7	33.26 .56	11.7 1.7	49.46 .72	7.4 1.6	38.07 .28	59.8 1.3	37.95 .29	64.9 1.2
May 9.7	33.80 .51	13.7 2.2	50.15 .65	9.3 2.2	38.35 .27	61.2 1.5	38.24 .28	63.7 1.3
19.6	34.28 .45	16.1 2.7	50.77 .57	11.7 2.6	38.62 .26	62.8 1.7	38.52 .27	62.4 1.3
29.6	34.69 +.37	19.0 +3.1	51.29 +.47	14.5 +3.0	38.87 +.24	64.5 +1.8	38.78 +.25	61.0 +1.4
June 8.6	35.02 .29	22.2 3.3	51.71 .36	17.6 3.3	39.09 .21	66.3 1.8	39.02 .23	59.6 1.4
18.6	35.27 .20	25.6 3.5	52.01 .24	21.0 3.4	39.29 .18	68.1 1.8	39.23 .20	58.3 1.3
28.5	35.41 +.10	29.2 3.6	52.18 +.11	24.5 3.5	39.45 .14	69.9 1.7	39.40 .16	57.0 1.2
July 8.5	35.46 .00	32.7 3.5	52.23 −.02	28.0 3.5	39.57 .10	71.6 1.6	39.54 .12	55.9 1.1
18.5	35.41 −.10	36.2 +3.4	52.14 −.15	31.6 +3.5	39.65 +.06	73.1 +1.5	39.64 +.07	54.8 +1.0
28.4	35.27 .19	39.6 3.3	51.93 .27	34.9 3.3	39.69 +.02	74.5 1.3	39.69 +.03	54 0 0.8
Aug. 7.4	35.03 .29	42.7 3.0	51.60 .39	38.1 3.1	39.68 −.03	75.8 1.1	39.70 −.01	53.3 0.6
17.4	34.70 .37	45.6 2.7	51.15 .50	41.1 2.8	39.63 .07	76.8 1.0	39.67 .06	52.7 0.5
27.4	34.29 .44	48.1 2.4	50.60 .60	43.7 2.4	39.54 .11	77.7 0.8	39.59 .10	52.3 0.3
Sept. 6.3	33.81 −.50	50.3 +1.9	49.96 −.68	45.9 +2.0	39.42 −.14	78.3 +0.5	39.48 −.13	52.0 +0.2
16.3	33.29 .55	52.0 1.5	49.25 .74	47.7 1.6	39.27 .16	78.8 0.3	39.34 .15	51.9 +0.1
26.3	32.72 .58	53.2 1.0	48.49 .78	49.1 1.1	39.10 .17	79.0 +0.1	39.17 .17	51.9 0.0
Oct. 6.3	32.13 .60	53.9 +0.5	47.69 .81	49.9 +0.6	38.92 .18	79.0 −0.1	39.00 .18	52.0 −0.2
16.2	31.53 .60	54.1 −0.1	46.88 .81	50.2 0.0	38.75 .17	78.9 0.2	38.82 .17	52.2 0.2
26.2	30.94 −.58	53.7 −0.7	46.08 −.79	49.9 −0.5	38.58 −.16	78.6 −0.4	38.65 −.16	52.4 −0.3
Nov. 5.2	30.38 .54	52.8 1.2	45.31 .74	49.1 1.1	38.42 .14	78.0 0.6	38.50 .15	52.8 0.4
15.1	29.87 .49	51.3 1.7	44.60 .68	47.8 1.6	38.30 .11	77.3 0.8	38.37 .11	53.3 0.5
25.1	29.42 .42	49.3 2.2	43.96 .60	45.9 2.1	38.20 .08	76.4 1.0	38.27 .08	53.8 0.6
Dec. 5.1	29.04 −.34	46 9 −2.7	43.41 −.49	43.6 −2.6	38.14 −.04	75.3 −1.1	38.21 −.04	54.5 −0.7
15.1	28.75 .24	44.0 3.0	42.98 .37	40.8 2.9	38.12 .00	74.1 1.3	38.19 .00	55.1 0.7
25.0	28.56 .14	40.8 3.3	42.67 .24	37.7 3.2	38.15 +.04	72.8 1.3	38.21 +.04	55.9 0.7
35.0	28.47 −.04	37.4 −3 5	42.50 −.10	34.3 −3.4	38.21 +.08	71.4 −1.4	38.27 +.07	56.6 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Aquilæ.		α Aquilæ. (*Altair.*)		ε Draconis.		β Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 19 40	° ′ +10 19	h m 19 45	° ′ + 8 33	h m 19 48	° ′ +69 58	h m 19 49	° ′ + 6 6
	s	″	s	″	s	″	s	″
Jan. 0.0	41.31 +.05	52.3 −1.7	3.98 +.04	44.5 −1.6	30.43 −.19	25.6 −3.2	33.48 +.04	63.0 −1.5
10.0	41.38 .08	50.6 1.7	4.04 .08	42.9 1.6	30.30 −.07	22.3 3.3	33.54 .07	61.5 1.5
20.0	41.47 .11	48.9 1.7	4.14 .11	41.3 1.5	30.29 +.05	18.9 3.4	33.63 .11	60.0 1.4
30.0	41.60 .15	47.3 1.6	4.27 .14	39.8 1.4	30.40 .17	15.5 3.3	33.76 .14	58.6 1.3
Feb. 8.9	41.77 .18	45.8 1.4	4.43 .17	38.4 1.2	30.62 .28	12.2 3.1	33.91 .17	57.4 1.1
18.9	41.96 +.20	44.6 −1.1	4.62 +.20	37.3 −1.0	30.96 +.39	9.2 −2.8	34.10 +.20	56.4 −0.9
28.9	42.17 .23	43.6 0.8	4.83 .22	36.4 0.7	31.39 .48	6.6 2.4	34.31 .22	55.6 0.6
Mar. 10.9	42.41 .25	43.0 0.4	5.06 .24	35.9 −0.4	31.91 .56	4.5 1.9	34.54 .24	55.1 −0.3
20.8	42.67 .26	42.8 −0.1	5.32 .26	35.7 0.0	32.50 .61	2.9 1.3	34.79 .26	55.0 0.0
30.8	42.94 .28	42.9 +0.3	5.59 .28	35.9 +0.4	33.14 .65	2.0 −0.6	35.06 .27	55.2 +0.4
Apr. 9.8	43.22 +.29	43.4 +0.7	5.87 +.29	36.4 +0.7	33.80 +.68	1.6 0.0	35.34 +.28	55.8 +0.7
19.7	43.51 .29	44.4 1.1	6.16 .29	37.4 1.1	34.48 .68	2.0 +0.7	35.62 .29	56.6 1.1
29.7	43.80 .29	45.6 1.4	6.45 .29	38.6 1.4	35.15 .60	3.0 1.3	35.91 .29	57.9 1.3
May 9.7	44.08 .28	47.1 1.7	6.74 .28	40.1 1.6	35.79 .62	4.5 1.8	36.20 .28	59.3 1.6
19.7	44.36 .27	48.9 1.9	7.01 .27	41.9 1.8	36.38 .56	6.6 2.3	36.48 .27	61.0 1.8
29.6	44.62 +.25	50.9 +2.0	7.28 +.25	43.8 +2.0	36.90 +.48	9.2 +2.8	36.74 +.25	62.8 +1.9
June 8.6	44.86 .22	53.0 2.1	7.52 .23	45.9 2.1	37.34 .40	12.1 3.1	36.98 .23	64.8 2.0
18.6	45.06 .19	55.2 2.2	7.73 .20	48.0 2.1	37.69 .30	15.4 3.4	37.20 .20	66.8 2.0
28.6	45.24 .16	57.3 2.2	7.91 .16	50.0 2.1	37.94 .20	18.8 3.5	37.38 .16	68.7 1.9
July 8.5	45.37 .12	59.4 2.1	8.05 .12	52.1 2.0	38.08 +.09	22.4 3.6	37.53 .13	70.6 1.8
18.5	45.47 +.07	61.4 +1.9	8.15 +.06	54.0 +1.9	38.12 −.02	26.0 +3.6	37.64 +.08	72.4 +1.7
28.5	45.52 +.03	63.3 1.8	8.21 +.03	55.8 1.7	38.04 .13	29.6 3.5	37.70 +.04	74.1 1.6
Aug. 7.4	45.52 −.02	64.9 1.6	8.22 −.01	57.4 1.5	37.85 .24	33.0 3.3	37.72 .00	75.6 1.4
17.4	45.48 .06	66.4 1.4	8.19 .05	58.8 1.3	37.56 .34	36.2 3.1	37.69 −.05	76.8 1.2
27.4	45.41 .10	67.6 1.1	8.12 .09	60.0 1.1	37.18 .43	39.1 2.8	37.62 .09	77.9 1.0
Sept. 6.4	45.29 −.13	68.6 +0.9	8.01 −.12	61.0 +0.8	36.71 −.51	41.7 +2.4	37.52 −.12	78.7 +0.7
16.3	45.15 .15	69.4 0.6	7.87 .15	61.6 0.6	36.17 .57	43.9 2.0	37.38 .15	79.3 0.5
26.3	44.98 .17	69.9 0.4	7.71 .17	62.1 0.3	35.58 .62	45.6 1.5	37.22 .17	79.7 +0.3
Oct. 6.3	44.81 .18	70.1 +0.1	7.54 .18	62.3 +0.1	34.94 .65	46.9 1.0	37.05 .18	79.8 0.0
16.3	44.62 .18	70.0 −0.2	7.36 .18	62.3 −0.2	34.28 .66	47.6 +0.5	36.88 .18	79.8 −0.2
26.2	44.45 −.17	69.7 −0.4	7.18 −.17	62.0 −0.4	33.62 −.66	47.8 −0.1	36.70 −.17	79.5 −0.4
Nov. 5.2	44.28 .15	69.2 0.7	7.02 .15	61.5 0.7	32.97 .63	47.5 0.6	36.54 .15	79.0 0.6
15.2	44.14 .13	68.3 0.9	6.88 .13	60.7 0.9	32.36 .59	46.5 1.2	36.40 .13	78.2 0.8
25.2	44.03 .10	67.3 1.2	6.77 .10	59.7 1.1	31.79 .53	45.0 1.8	36.29 .10	77.3 1.0
Dec. 5.1	43.95 −.06	66.0 −1.4	6.69 −.06	58.5 −1.3	31.30 −.45	43.0 −2.3	36.21 −.07	76.2 −1.2
15.1	43.90 −.02	64.5 1.5	6.65 −.02	57.2 1.4	30.89 .36	40.5 2.7	36.16 −.03	74.9 1.3
25.1	43.90 +.01	62.9 1.7	6.64 +.01	55.7 1.6	30.58 .26	37.7 3.0	36.15 +.01	73.5 1.4
35.0	43.94 +.05	61.2 −1.7	6.67 +.05	54.1 −1.6	30.37 −.15	34.5 −3.3	36.18 +0.5	72.0 −1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Aquilæ.		α² Capricorni.		κ Cephei.		α Pavonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 58	° ′ + 6 56	h m 20 11	° ′ −12 54	h m 20 12	° ′ +77 21	h m 20 16	° ′ −57 6
	s	″	s	″	s	″	s	″
Jan. 0.1	25.03 +.03	62.7 −1.5	33.31 +.03	18.1 −0.3	43.29 −.45	46.9 −3.0	22.10 .00	29.5 +2.2
10.0	25.07 .06	61.2 1.5	33.36 .07	18.4 0.3	42.92 .27	43.8 3.2	22.14 +.07	27.3 2.3
20.0	25.16 .10	59.8 1.4	33.44 .10	18.7 0.2	42.74 −.09	40.5 3.2	22.24 .14	24.9 2.4
30.0	25.27 .13	58.4 1.3	33.56 .13	18.8 −0.1	42.76 +.10	37.1 3.3	22.42 .20	22.4 2.4
Feb. 9.0	25.42 .16	57.1 1.2	33.71 .16	18.9 0.0	42.95 .29	33.8 3.2	22.65 .26	20.0 2.4
18.9	25.59 +.19	56.0 −0.9	33.88 +.19	18.8 +0.1	43.34 +.47	30.7 −3.0	22.98 +.31	17.6 +2.3
28.9	25.80 .22	55.2 0.6	34.08 .22	18.6 0.3	43.89 .63	27.9 2.6	23.27 .36	15.3 2.2
Mar. 10.9	26.02 .24	54.8 −0.3	34.31 .24	18.2 0.5	44.60 .77	25.5 2.2	23.65 .40	13.1 2.1
20.8	26.27 .26	54.6 0.0	34.56 .26	17.7 0.7	45.42 .88	23.6 1.6	24.07 .44	11.1 1.9
30.8	26.53 .27	54.8 +0.4	34.83 .28	16.9 0.8	46.35 .96	22.2 1.0	24.52 .46	9.4 1.6
Apr. 9.8	26.81 +.28	55.4 +0.7	35.11 +.29	16.0 +1.0	47.35 1.01	21.6 −0.4	25.00 +.49	7.9 +1.4
19.8	27.10 .29	56.3 1.0	35.40 .30	14.9 1.1	48.37 1.03	21.5 +0.3	25.49 .50	6.6 1.1
29.7	27.39 .29	57.5 1.4	35.70 .30	13.7 1.2	49.39 1.01	22.0 0.9	26.00 .50	5.7 0.8
May 9.7	27.68 .29	59.0 1.6	36.01 .30	12.4 1.3	50.38 .96	23.2 1.5	26.50 .50	5.1 0.4
19.7	27.96 .28	60.7 1.8	36.30 .29	11.1 1.3	51.30 .86	25.0 2.0	27.00 .49	4.8 +0.1
29.7	28.23 +.26	62.6 +1.9	36.59 +.28	9.8 +1.3	52.13 +.77	27.2 +2.5	27.47 +.46	4.9 −0.3
June 8.6	28.48 .24	64.6 2.0	36.86 .26	8.4 1.3	52.84 .65	29.9 2.9	27.92 .43	5.3 0.6
18.6	28.70 .21	66.6 2.0	37.11 .23	7.2 1.2	53.42 .50	32.9 3.2	28.32 .38	6.1 0.9
28.6	28.89 .17	68.6 2.0	37.33 .20	6.1 1.0	53.85 .35	36.2 3.4	28.68 .32	7.2 1.3
July 8.5	29.04 .13	70.6 1.9	37.50 .16	5.2 0.9	54.11 .18	39.7 3.5	28.97 .26	8.6 1.5
18.5	29.16 +.09	72.5 +1.8	37.64 +.12	4.4 +0.7	54.21 +.01	43.3 +3.6	29.19 +.19	10.2 −1.7
28.5	29.23 +.05	74.2 1.6	37.74 .07	3.7 0.6	54.14 −.15	46.9 3.6	29.34 .11	12.0 1.9
Aug. 7.5	29.25 .00	75.8 1.5	37.79 +.02	3.2 0.4	53.90 .32	50.4 3.5	29.41 +.03	14.0 2.0
17.4	29.23 −.04	77.1 1.3	37.79 −.02	3.0 0.2	53.50 .47	53.8 3.3	29.40 −.05	16.0 2.0
27.4	29.17 .08	78.2 1.0	37.75 .06	2.8 +0.1	52.96 .61	56.9 3.0	29.31 .12	18.0 1.9
Sept. 6.4	29.07 −.12	79.2 +0.8	37.66 −.10	2.8 0.0	52.28 −.74	59.8 +2.7	29.15 −.19	19.9 −1.8
16.4	28.94 .14	79.8 0.6	37.55 .13	2.9 −0.1	51.48 .85	62.4 2.4	28.93 .25	21.6 1.6
26.3	28.79 .16	80.3 0.3	37.40 .15	3.1 0.2	50.58 .94	64.5 1.9	28.66 .29	23.0 1.3
Oct. 6.3	28.62 .17	80.5 +0.1	37.24 .17	3.4 0.3	49.61 1.00	66.2 1.4	28.35 .32	24.2 1.0
16.3	28.44 .18	80.4 −0.2	37.07 .17	3.7 0.3	48.58 1.04	67.4 0.9	28.01 .34	25.0 0.6
26.2	28.27 −.17	80.2 −0.4	36.90 −.17	4.0 −0.4	47.52 1.06	68.0 +0.4	27.67 −.33	25.3 −0.2
Nov. 5.2	28.11 .15	79.7 0.6	36.74 .15	4.4 0.4	46.47 1.04	68.1 −0.2	27.34 .32	25.3 +0.3
15.2	27.96 .13	79.0 0.8	36.59 .13	4.8 0.4	45.44 1.00	67.7 0.8	27.04 .28	24.8 0.7
25.2	27.85 .10	78.1 1.0	36.48 .10	5.2 0.4	44.47 .93	66.6 1.3	26.78 .23	23.9 1.1
Dec. 5.1	27.76 −.07	77.0 −1.2	36.39 −.07	5.6 −0.4	43.59 −.83	65.0 −1.9	26.58 −.18	22.6 +1.4
15.1	27.71 −.03	75.7 1.3	36.33 −.03	6.0 0.4	42.82 .70	62.9 2.3	26.43 .11	21.0 1.8
25.1	27.69 .00	74.3 1.4	36.32 .00	6.3 0.4	42.19 .56	60.4 2.8	26.36 −.04	19.1 2.0
35.1	27.71 +.04	72.8 −1.5	36.34 +.04	6.7 −0.4	41.71 −.39	57.4 −3.1	26.35 +.02	16.9 +2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cygni.		π Capricorni.		ε Delphini.		Groombridge 3241.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$20^{h}\ 18^{m}$	$+39^{\circ}\ 52'$	$20^{h}\ 20^{m}$	$-18^{\circ}\ 35'$	$20^{h}\ 27^{m}$	$+10^{\circ}\ 54'$	$20^{h}\ 30^{m}$	$+72^{\circ}\ 7'$
	s	″	s	″	s	″	s	″
Jan. 0.1	1.05 −.04	70.6 −2.7	36.98 +.02	35.2 0.0	37.02 .00	32.2 −1.5	27.08 −.34	84.2 −2.9
10.0	1.03 .00	67.9 2.8	37.02 .06	35.1 +0.1	37.03 +.03	30.6 1.6	26.80 .21	81.2 3.1
20.0	1.06 +.05	65.0 2.9	37.09 .09	35.0 0.2	37.08 .07	29.0 1.6	26.65 −.08	77.9 3.3
30.0	1.13 .10	62.1 2.8	37.20 .13	34.8 0.3	37.17 .10	27.5 1.5	26.63 +.05	74.6 3.4
Feb. 9.0	1.25 .14	59.4 2.6	37.35 .16	34.5 0.4	37.28 .13	26.0 1.3	26.75 .18	71.2 3.3
18.9	1.42 +.19	56.9 −2.4	37.52 +.19	34.1 +0.5	37.43 +.16	24.8 −1.1	26.99 +.31	68.0 −3.1
28.9	1.62 .23	54.7 2.0	37.72 .22	33.5 0.6	37.61 .19	23.8 0.8	27.36 .43	65.1 2.7
Mar. 10.9	1.87 .26	52.9 1.5	37.95 .24	32.8 0.8	37.81 .22	23.2 0.5	27.84 .53	62.6 2.3
20.9	2.14 .29	51.7 1.0	38.20 .26	32.0 0.9	38.04 .24	22.8 −0.1	28.41 .62	60.5 1.8
30.8	2.45 .32	50.9 −0.5	38.47 .28	31.0 1.0	38.29 .26	22.9 +0.2	29.06 .69	59.0 1.2
Apr. 9.8	2.77 +.33	50.7 +0.1	38.75 +.29	30.0 +1.1	38.56 +.28	23.3 +0.6	29.77 +.73	58.2 −0.5
19.8	3.11 .34	51.2 0.7	39.05 .30	28.8 1.2	38.84 .29	24.1 1.0	30.52 .75	58.0 +0.1
29.7	3.46 .35	52.1 1.2	39.36 .31	27.6 1.3	39.14 .30	25.3 1.3	31.27 .75	58.4 0.7
May 9.7	3.81 .34	53.6 1.7	39.67 .31	26.3 1.3	39.44 .30	26.8 1.6	32.01 .73	50.4 1.3
19.7	4.14 .33	55.6 2.2	39.98 .30	25.1 1.2	39.73 .29	28.6 1.9	32.72 .68	61.0 1.9
29.7	4.46 +.30	58.0 +2.6	40.28 +.29	23.8 +1.2	40.01 +.27	30.5 +2.0	33.37 +.62	63.1 +2.4
June 8.6	4.75 .27	60.7 2.8	40.57 .27	22.7 1.1	40.28 .26	32.6 2.2	33.94 .54	65.7 2.8
18.6	5.00 .24	63.6 3.0	40.83 .25	21.7 0.9	40.52 .23	34.9 2.2	34.43 .44	68.7 3.1
28.6	5.22 .19	66.8 3.2	41.06 .21	20.9 0.8	40.73 .20	37.1 2.2	34.82 .33	72.0 3.4
July 8.6	5.38 .14	70.0 3.2	41.25 .17	20.2 0.6	40.91 .16	39.3 2.2	35.09 .22	75.4 3.5
18.5	5.50 +.09	73.2 +3.2	41.40 +.13	19.7 +0.4	41.04 +.12	41.4 +2.1	35.25 +.10	79.0 +3.6
28.5	5.56 +.04	76.4 3.1	41.51 .08	19.4 0.2	41.14 .07	43.4 1.9	35.28 −.03	82.7 3.6
Aug. 7.5	5.57 −.02	79.4 2.9	41.56 +.04	19.2 +0.1	41.19 +.03	45.2 1.7	35.20 .15	86.3 3.5
17.4	5.53 .07	82.2 2.7	41.58 −.01	19.2 −0.1	41.19 −.02	46.9 1.5	34.99 .26	89.8 3.4
27.4	5.44 .12	84.8 2.4	41.54 .06	19.4 0.2	41.16 .06	48.3 1.3	34.67 .37	93.1 3.2
Sept. 6.4	5.30 −.16	87.1 +2.1	41.46 −.09	19.7 −0.3	41.08 −.09	49.4 +1.1	34.25 −.47	96.1 +2.9
16.4	5.12 .20	89.0 1.7	41.35 .13	20.0 0.4	40.97 .13	50.4 0.8	33.74 .55	98.8 2.5
26.3	4.91 .22	90.6 1.3	41.21 .15	20.4 0.4	40.82 .15	51.0 0.5	33.16 .63	101.1 2.1
Oct. 6.3	4.68 .24	91.7 0.9	41.05 .17	20.9 0.4	40.67 .17	51.4 +0.3	32.51 .68	103.0 1.6
16.3	4.43 .25	92.4 +0.4	40.87 .18	21.3 0.4	40.50 .17	51.6 0.0	31.82 .71	104.4 1.1
26.2	4.18 −.25	92.6 0.0	40.70 −.17	21.7 −0.4	40.32 −.17	51.4 −0.3	31.10 −.72	105.2 +0.6
Nov. 5.2	3.94 .24	92.3 −0.5	40.53 .16	22.1 0.3	40.16 .16	51.0 0.5	30.37 .72	105.5 0.0
15.2	3.71 .22	91.6 1.0	40.38 .14	22.4 0.3	40.00 .14	50.4 0.8	29.66 .70	105.2 −0.6
25.2	3.51 .19	90.4 1.4	40.26 .11	22.6 0.2	39.87 .12	49.5 1.0	28.90 .65	104.4 1.1
Dec. 5.1	3.34 −.16	88.7 −1.9	40.16 −.08	22.8 −0.2	39.76 −.09	48.4 −1.2	28.36 −.59	103.0 −1.7
15.1	3.20 .12	86.6 2.2	40.10 −.04	23.0 −0.1	39.69 .06	47.1 1.4	27.82 .50	101.0 2.2
25.1	3.10 .07	84.2 2.5	40.08 .00	23.1 0.0	39.65 −.02	45.7 1.5	27.36 .41	98.6 2.7
35.1	3.05 −.02	81.6 −2.7	40.09 +.03	23.1 0.0	39.64 +.01	44.1 −1.6	27.01 −.30	95.7 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cygni.		μ Aquarii.		ν Cygni.		12 Year Cat. 1879.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 20 37	° ′ +44 51	h m 20 46	° ′ − 9 24	h m 20 52	° ′ +40 42	h m 20 52	° ′ +80 6
	s	″	s	″	s	″	s	″
Jan. 0.1	25.80 −.08	60.4 −2.6	20.23 .00	72.2 −0.5	48.07 −.08	76.7 −2.4	45.94 −.78	65.5 −2.6
10.1	25.74 −.03	57.6 2.9	20.24 +.03	72.7 0.4	48.01 −.04	74.2 2.7	45.26 .57	62.8 2.9
20.0	25.74 +.02	54.7 3.0	20.29 .06	73.1 0.4	48.00 +.01	71.4 2.8	44.80 .35	59.7 3.2
30.0	25.78 .07	51.7 3.0	20.36 .09	73.4 0.3	48.03 .05	68.6 2.8	44.57 −.11	56.5 3.3
Feb. 9.0	25.88 .12	48.8 2.8	20.47 .12	73.6 −0.1	48.10 .10	65.8 2.7	44.59 +.14	53.2 3.3
19.0	26.02 +.17	46.1 −2.6	20.61 +.15	73.6 0.0	48.23 +.15	63.2 −2.5	44.85 +.38	49.9 −3.2
28.9	26.22 .21	43.7 2.2	20.78 .18	73.5 +0.2	48.40 .19	60.9 2.2	45.34 .60	46.8 2.9
Mar. 10.9	26.45 .26	41.6 1.8	20.98 .21	73.2 0.4	48.61 .23	58.9 1.8	46.05 .81	44.1 2.5
20.9	26.73 .30	40.1 1.3	21.20 .23	72.6 0.7	48.86 .27	57.4 1.3	46.94 .98	41.8 2.1
30.8	27.04 .33	39.1 0.7	21.44 .25	71.8 0.9	49.14 .30	56.4 0.7	48.00 1.12	40.0 1.5
Apr. 9.8	27.38 +.35	38.6 −0.1	21.70 +.27	70.9 +1.1	49.45 +.32	55.9 −0.2	49.18 1.22	38.7 −0.9
19.8	27.74 .37	38.8 +0.4	21.99 .29	69.7 1.2	49.79 .34	56.0 +0.4	50.43 1.28	38.1 −0.3
29.8	28.11 .37	39.5 1.0	22.28 .30	68.4 1.4	50.14 .35	56.7 0.0	51.72 1.29	38.1 +0.3
May 9.7	28.48 .37	40.8 1.5	22.58 .30	66.9 1.5	50.49 .35	57.9 1.5	53.01 1.27	38.7 0.9
19.7	28.84 .36	42.6 2.0	22.88 .30	65.4 1.6	50.84 .35	59.6 1.9	54.24 1.20	39.9 1.5
29.7	20.18 +.33	44.9 +2.4	23.18 +.29	63.8 +1.6	51.18 +.33	61.7 +2.3	55.39 1.10	41.7 +2.0
June 8.6	29.50 .30	47.5 2.8	23.46 .28	62.3 1.5	51.50 .30	64.2 2.7	56.42 .96	43.9 2.5
18.6	29.79 .26	50.4 3.1	23.73 .25	60.8 1.5	51.79 .27	67.1 2.9	57.31 .80	46.6 2.9
28.6	30.03 .22	53.6 3.3	23.97 .22	59.4 1.3	52.04 .23	70.1 3.1	58.02 .62	49.6 3.2
July 8.6	30.23 .17	56.9 3.3	24.17 .19	58.1 1.2	52.25 .18	73.3 3.2	58.55 .42	53.0 3.4
18.5	30.37 +.11	60.2 +3.3	24.34 +.14	57.0 +1.0	52.41 +.13	76.5 +3.2	58.87 +.22	56.4 +3.6
28.5	30.46 +.06	63.6 3.3	24.46 .10	56.1 0.8	52.52 .08	79.8 3.2	58.99 +.01	60.0 3.6
Aug. 7.5	30.48 .00	66.8 3.2	24.54 .06	55.4 0.6	52.57 +.03	82.9 3.1	58.89 −.20	63.7 3.6
17.5	30.46 −.06	69.9 3.0	24.57 +.01	54.8 0.4	52.57 −.03	85.9 2.9	58.60 .40	67.3 3.5
27.4	30.37 .11	72.8 2.7	24.56 −.03	54.5 0.3	52.52 .08	88.7 2.7	58.10 .59	70.7 3.4
Sept. 6.4	30.24 −.16	75.3 +2.4	24.51 −.07	54.3 +0.1	52.42 −.12	91.3 +2.4	57.42 −.76	74.0 +3.1
16.4	30.06 .20	77.6 2.1	24.42 .11	54.3 0.0	52.27 .16	93.5 2.0	56.58 .92	77.0 2.8
26.3	29.85 .23	79.4 1.6	24.30 .13	54.4 −0.2	52.09 .20	95.4 1.7	55.58 1.06	79.6 2.5
Oct. 6.3	29.60 .25	80.8 1.2	24.15 .15	54.6 0.3	51.88 .22	96.8 1.3	54.46 1.17	81.9 2.0
16.3	29.34 .27	81.8 0.7	23.99 .16	54.9 0.4	51.65 .23	97.8 0.8	53.24 1.26	83.7 1.6
26.3	29.07 −.27	82.3 +0.3	23.83 −.16	55.3 −0.4	51.41 −.24	98.4 +0.3	51.96 1.31	85.0 +1.1
Nov. 5.2	28.81 .26	82.3 −0.2	23.67 .15	55.8 0.5	51.17 .24	98.5 −0.1	50.63 1.33	85.8 +0.5
15.2	28.55 .25	81.8 0.8	23.52 .14	56.3 0.5	50.94 .23	98.2 0.6	49.30 1.32	86.0 −0.1
25.2	28.31 .22	80.8 1.2	23.39 .12	56.8 0.5	50.72 .21	97.3 1.1	48.01 1.26	85.6 0.7
Dec. 5.2	28.11 −.19	79.3 −1.7	23.29 −.09	57.3 −0.5	50.53 −.18	96.0 −1.5	46.78 1.18	84.0 −1.3
15.1	27.93 .15	77.4 2.1	23.21 .06	57.8 0.5	50.36 .15	94.2 1.9	45.66 1.05	83.0 1.8
25.1	27.80 .11	75.1 2.5	23.17 −.03	58.4 0.5	50.24 .11	92.1 2.3	44.68 .90	81.0 2.3
35.1	27.71 −.06	72.4 −2.8	23.16 .00	58.9 −0.5	50.15 −.07	89.7 −2.6	43.88 −.71	78.4 −2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61^1 Cygni.		ζ Cygni.		α Cephei.		1 Pegasi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$21^{h}\ 1^{m}$	$+38^{\circ}\ 10'$	$21^{h}\ 7^{m}$	$+29^{\circ}\ 44'$	$21^{h}\ 15^{m}$	$+62^{\circ}\ 5'$	$21^{h}\ 16^{m}$	$+19^{\circ}\ 18'$
	s	″	s	″	s	″	s	″
Jan. 0.1	38.66 −.07	43.3 −2.2	57.03 −.06	64.4 −2.1	45.98 −.25	43.6 −2.5	40.28 −.05	27.5 −1.7
10.1	38.61 −.03	41.0 2.5	56.99 −.03	62.2 2.2	45.77 .18	40.9 2.8	40.25 −.02	25.7 1.8
20.0	38.60 +.01	38.4 2.6	56.98 +.02	59.9 2.3	45.63 .10	37.9 3.1	40.24 +.01	23.9 1.9
30.0	38.63 .06	35.8 2.6	57.00 .05	57.5 2.3	45.56 −.02	34.8 3.2	40.27 .05	22.0 1.8
Feb. 9.0	38.71 .11	33.3 2.5	57.07 .09	55.2 2.2	45.58 +.06	31.5 3.2	40.34 .08	20.2 1.7
19.0	38.83 +.15	30.8 −2.3	57.17 +.12	53.0 −2.0	45.68 +.14	28.4 −3.1	40.43 +.11	18.6 −1.5
28.9	39.00 .19	28.7 2.0	57.32 .16	51.1 1.8	45.86 .22	25.4 2.8	40.56 .15	17.2 1.3
Mar. 10.9	39.20 .23	26.9 1.6	57.50 .20	49.6 1.4	46.12 .29	22.7 2.5	40.73 .18	16.1 1.0
20.9	39.45 .26	25.4 1.2	57.71 .23	48.4 1.0	46.45 .36	20.4 2.0	40.93 .21	15.3 0.6
30.9	39.73 .29	24.5 0.7	57.96 .26	47.6 −0.5	46.84 .42	18.7 1.5	41.15 .24	14.9 −0.1
Apr. 9.8	40.03 +.32	24.2 −0.1	58.23 +.29	47.4 0.0	47.29 +.47	17.5 −0.9	41.40 +.26	15.0 +0.3
19.8	40.36 .34	24.3 +0.5	58.52 .31	47.6 +0.5	47.78 .50	16.9 −0.3	41.68 .28	15.5 0.7
29.8	40.71 .35	25.1 1.0	58.84 .32	48.4 1.0	48.29 .52	16.9 +0.3	41.97 .30	16.4 1.1
May 9.7	41.07 .36	26.3 1.5	59.16 .32	49.6 1.4	48.82 .52	17.5 0.9	42.28 .31	17.7 1.5
19.7	41.42 .35	28.0 2.0	59.48 .32	51.2 1.8	49.34 .51	18.7 1.5	42.58 .31	19.4 1.8
29.7	41.77 +.34	30.2 +2.4	59.80 +.31	53.2 +2.2	49.84 +.49	20.5 +2.0	42.89 +.30	21.3 +2.1
June 8.7	42.10 .31	32.7 2.7	60.10 .29	55.6 2.5	50.31 .45	22.8 2.5	43.18 .29	23.5 2.3
18.6	42.40 .28	35.6 3.0	60.38 .27	58.2 2.7	50.74 .40	25.5 2.9	43.46 .26	25.9 2.5
28.6	42.66 .25	38.6 3.1	60.64 .23	61.0 2.8	51.11 .34	28.5 3.2	43.71 .24	28.4 2.5
July 8.6	42.89 .20	41.8 3.2	60.85 .19	63.8 2.9	51.42 .27	31.8 3.4	43.93 .20	31.0 2.5
18.6	43.07 +.17	45.1 +3.3	61.02 +.15	66.8 +2.9	51.65 +.19	35.4 +3.6	44.11 +.16	33.5 +2.5
28.5	43.20 .10	48.3 3.2	61.15 .10	69.6 2.9	51.80 .11	39.0 3.6	44.25 .12	36.0 2.4
Aug. 7.5	43.27 +.05	51.5 3.1	61.23 .06	72.4 2.7	51.88 +.03	42.6 3.6	44.34 .07	38.3 2.3
17.5	43.30 .00	54.5 2.9	61.26 +.01	75.1 2.5	51.87 −.05	46.2 3.5	44.39 +.03	40.5 2.1
27.4	43.27 −.05	57.4 2.7	61.24 −.04	77.5 2.3	51.78 .13	49.7 3.4	44.39 −.02	42.5 1.9
Sept. 6.4	43.20 −.10	60.0 +2.4	61.18 −.08	79.7 +2.1	51.62 −.20	52.9 +3.1	44.35 −.06	44.2 +1.6
16.4	43.08 .14	62.2 2.1	61.08 .12	81.6 1.7	51.39 .26	55.9 2.8	44.27 .10	45.7 1.3
26.4	42.92 .17	64.2 1.8	60.94 .15	83.2 1.4	51.10 .32	58.5 2.5	44.16 .13	46.8 1.0
Oct. 6.3	42.74 .20	65.7 1.4	60.78 .17	84.4 1.0	50.76 .36	60.8 2.0	44.02 .15	47.7 0.7
16.3	42.54 .21	66.9 0.9	60.60 .19	85.3 0.7	50.38 .40	62.6 1.6	43.87 .16	48.3 0.4
26.3	42.32 −.22	67.6 +0.5	60.41 −.20	85.7 +0.3	49.96 −.42	63.9 +1.1	43.70 −.17	48.6 +0.1
Nov. 5.3	42.10 .22	67.8 0.0	60.21 .19	85.8 −0.1	49.54 .42	64.7 +0.5	43.53 .17	48.5 −0.2
15.2	41.89 .20	67.6 −0.5	60.02 .18	85.4 0.5	49.12 .42	64.9 −0.1	43.37 .16	48.1 0.5
25.2	41.70 .19	66.9 0.9	59.84 .17	84.7 0.9	48.70 .40	64.6 0.6	43.21 .14	47.4 0.8
Dec. 5.2	41.52 −.16	65.8 −1.3	59.69 −.15	83.5 −1.3	48.31 −.38	63.6 −1.2	43.08 −.12	46.4 −1.1
15.1	41.37 .13	64.2 1.7	59.56 .12	82.0 1.7	47.95 .34	62.1 1.7	42.96 .10	45.2 1.4
25.1	41.26 .10	62.3 2.1	59.45 .09	80.2 1.9	47.64 .28	60.1 2.2	42.88 .07	43.7 1.6
35.1	41.18 −.06	60.0 −2.3	59.38 −.05	78.2 −2.2	47.39 −.23	57.7 −2.6	42.82 −.04	42.0 −1.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aquarii.		β Cephei.		ξ Aquarii.		ε Pegasi.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	$21^h\ 25^m$	$-6^\circ\ 4'$	$21^h\ 27^m$	$+70^\circ\ 2'$	$21^h\ 31^m$	$-8^\circ\ 22'$	$21^h\ 38^m$	$+9^\circ\ 20'$
	s	″	s	″	s	″	s	″
Jan. 0.1	23.76 −.04	61.5 −0.6	6.98 −.40	70.6 −2.3	31.22 −.04	37.0 −0.5	26.28 −.05	30.0 −1.2
10.1	23.74 −.01	62.1 0.6	6.63 .31	68.1 2.7	31.19 −.01	37.4 0.4	26.24 −.03	28.7 1.3
20.1	23.75 +.02	62.6 0.5	6.37 .21	65.2 3.0	31.19 +.02	37.8 0.4	26.23 .00	27.4 1.3
30.0	23.78 .05	63.1 0.4	6.21 −.10	62.0 3.2	31.22 .05	38.1 0.2	26.24 +.03	26.1 1.2
Feb. 9.0	23.85 .08	63.4 0.2	6.17 +.01	58.8 3.3	31.28 .08	38.3 −0.1	26.29 .06	24.9 1.1
19.0	23.95 +.11	63.5 −0.1	6.24 +.13	55.5 −3.2	31.38 +.11	38.3 +0.1	26.37 +.09	23.9 −1.0
28.9	24.08 .14	63.5 +0.1	6.43 .25	52.4 3.0	31.50 .14	38.1 0.3	26.48 .13	23.0 0.7
Mar. 10.9	24.24 .17	63.3 0.4	6.74 .36	49.5 2.7	31.65 .17	37.8 0.5	26.62 .16	22.4 0.5
20.9	24.42 .20	62.8 0.6	7.14 .47	47.0 2.3	31.84 .20	37.1 0.7	26.79 .19	22.1 −0.1
30.9	24.64 .23	62.1 0.8	7.64 .54	45.0 1.8	32.05 .22	36.3 1.0	27.00 .22	22.1 +0.2
Apr. 9.8	24.88 +.25	61.1 +1.1	8.21 +.61	43.5 −1.2	32.28 +.25	35.2 +1.2	27.23 +.24	22.5 +0.6
19.8	25.14 .27	59.9 1.3	8.84 .65	42.6 −0.6	32.55 .27	34.0 1.4	27.49 .27	23.2 0.9
29.8	25.42 .29	58.5 1.5	9.52 .68	42.3 0.0	32.82 .29	32.6 1.5	27.76 .29	24.3 1.2
May 9.8	25.72 .30	57.0 1.6	10.21 .69	42.6 +0.6	33.12 .30	31.0 1.6	28.06 .30	25.7 1.5
19.7	26.02 .30	55.3 1.7	10.90 .68	43.6 1.2	33.43 .30	29.3 1.7	28.36 .30	27.3 1.7
29.7	26.32 +.30	53.6 +1.8	11.56 +.65	45.1 +1.8	33.73 +.30	27.6 +1.7	28.66 +.30	29.2 +2.0
June 8.7	26.62 .29	51.8 1.8	12.18 .60	47.2 2.3	34.03 .29	25.8 1.7	28.96 .29	31.2 2.1
18.6	26.90 .27	50.1 1.7	12.75 .53	49.7 2.7	34.32 .28	24.2 1.6	29.24 .27	33.3 2.2
28.6	27.16 .25	48.4 1.6	13.24 .45	52.6 3.1	34.58 .25	22.6 1.5	29.50 .25	35.5 2.2
July 8.6	27.39 .22	46.9 1.5	13.65 .36	55.8 3.4	34.82 .22	21.1 1.4	29.73 .22	37.7 2.2
18.6	27.58 +.18	45.5 +1.3	13.96 +.26	59.3 +3.6	35.02 +.18	19.8 +1.2	29.93 +.18	39.9 +2.1
28.5	27.74 .14	44.3 1.1	14.16 .15	62.9 3.7	35.19 .14	18.7 1.0	30.09 .14	41.9 2.0
Aug. 7.5	27.86 .09	43.3 0.9	14.26 +.05	66.6 3.7	35.31 .10	17.8 0.8	30.21 .10	43.8 1.8
17.5	27.92 +.05	42.5 0.7	14.26 −.06	70.3 3.6	35.38 .05	17.2 0.6	30.29 .05	45.5 1.6
27.5	27.95 .00	41.9 0.5	14.14 .16	73.9 3.5	35.41 +.01	16.7 0.4	30.32 +.01	47.0 1.4
Sept. 6.4	27.93 −.04	41.5 +0.3	13.93 −.26	77.3 +3.3	35.40 −.03	16.5 +0.2	30.31 −.03	48.2 +1.2
16.4	27.87 .07	41.3 +0.1	13.62 .35	80.5 3.1	35.35 .07	16.4 0.0	30.26 .07	49.2 0.9
26.4	27.78 .11	41.3 −0.1	13.23 .43	83.4 2.7	35.26 .10	16.5 −0.2	30.17 .10	50.0 0.7
Oct. 6.3	27.66 .13	41.5 0.2	12.76 .50	86.0 2.3	35.15 .12	16.7 0.3	30.06 .12	50.6 0.4
16.3	27.52 .15	41.7 0.3	12.24 .55	88.0 1.9	35.01 .14	17.1 0.4	29.92 .14	50.9 +0.2
26.3	27.37 −.15	42.1 −0.4	11.68 −.58	89.7 +1.4	34.86 −.15	17.5 −0.5	29.78 −.15	50.9 −0.1
Nov. 5.3	27.22 .15	42.6 0.5	11.08 .60	90.8 0.8	34.71 .15	18.0 0.5	29.63 .15	50.8 0.3
15.2	27.08 .14	43.1 0.6	10.47 .61	91.3 +0.2	34.57 .14	18.6 0.6	29.48 .15	50.3 0.5
25.2	26.94 .13	43.7 0.6	9.87 .60	91.2 −0.4	34.43 .13	19.2 0.6	29.34 .14	49.7 0.7
Dec. 5.2	26.82 −.11	44.3 −0.6	9.28 −.56	90.6 −1.0	34.31 −.11	19.8 −0.6	29.21 −.12	48.9 −0.9
15.2	26.73 .08	45.0 0.7	8.74 .51	89.3 1.5	34.21 .09	20.4 0.6	29.10 .10	47.9 1.1
25.1	26.66 .06	45.6 0.7	8.26 .45	87.5 2.0	34.14 .06	21.0 0.6	29.02 .07	46.8 1.2
35.1	26.61 −.03	46.3 −0.6	7.85 −.37	85.2 −2.5	34.09 −.03	21.5 −0.5	28.96 −.05	45.5 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	11 Cephei.		μ Capricorni.		79 Draconis.		α Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$21^{h}\ 40^{m}$	$+70°\ 46'$	$21^{h}\ 46^{m}$	$-14°\ 5'$	$21^{h}\ 51^{m}$	$+73°\ 8'$	$21^{h}\ 59^{m}$	$-\ 0°\ 52'$
	s	″	s	″	s	″	s	″
Jan. 0.1	10.72 −.44	43.8 −2.2	54.83 −.05	63.9 −0.2	22.86 −.54	78.3 −2.0	46.43 −.06	69.7 −0.8
10.1	10.32 .35	41.4 2.6	54.79 −.02	64.1 −0.1	22.37 .44	76.0 2.5	46.38 .04	70.5 0.8
20.1	10.02 .25	38.7 2.9	54.78 +.01	64.1 0.0	21.98 .33	73.4 2.8	46.35 −.01	71.2 0.7
30.0	9.82 .14	35.6 3.2	54.80 .03	64.1 +0.1	21.71 .21	70.4 3.1	46.35 +.02	71.9 0.6
Feb. 9.0	9.74 −.02	32.4 3.3	54.85 .06	63.9 0.3	21.57 −.07	67.2 3.2	46.38 .05	72.5 0.5
19.0	9.78 +.10	29.1 −3.2	54.92 +.09	63.5 +0.5	21.57 +.07	63.9 −3.2	46.44 +.08	72.9 −0.3
Mar. 1.0	9.94 .22	25.9 3.1	55.04 .13	62.9 0.7	21.70 .21	60.7 3.1	46.54 .11	73.2 −0.1
10.9	10.22 .33	23.0 2.8	55.18 .16	62.2 0.9	21.98 .34	57.7 2.9	46.66 .14	73.2 +0.1
20.9	10.60 .44	20.4 2.4	55.35 .19	61.2 1.0	22.38 .46	55.0 2.5	46.81 .17	72.9 0.4
30.9	11.09 .53	18.2 1.9	55.55 .22	60.1 1.2	22.90 .57	52.7 2.1	47.00 .20	72.4 0.7
Apr. 9.9	11.66 +.61	16.6 −1.4	55.79 +.25	58.8 +1.4	23.52 +.66	50.9 −1.5	47.22 +.23	71.6 +0.9
19.8	12.30 .66	15.5 0.8	56.04 .27	57.3 1.5	24.22 .73	49.6 1.0	47.46 .26	70.6 1.2
29.8	12.99 .70	15.1 −0.1	56.32 .29	55.7 1.6	24.98 .78	49.0 −0.4	47.72 .28	69.2 1.4
May 9.8	13.70 .71	15.2 +0.5	56.62 .30	54.0 1.7	25.77 .80	48.9 +0.3	48.01 .29	67.7 1.6
19.7	14.42 .71	16.0 1.1	56.93 .31	52.3 1.7	26.58 .80	49.5 0.9	48.31 .30	66.0 1.8
29.7	15.12 +.68	17.4 +1.6	57.24 +.31	50.6 +1.7	27.37 +.77	50.7 +1.5	48.61 +.30	64.2 +1.9
June 8.7	15.78 .64	19.3 2.1	57.55 .30	48.9 1.6	28.12 .73	52.4 2.0	48.91 .30	62.3 1.9
18.7	16.38 .57	21.6 2.6	57.85 .29	47.4 1.5	28.82 .66	54.7 2.5	49.21 .28	60.3 1.9
28.6	16.92 .49	24.4 3.0	58.13 .27	45.9 1.3	29.44 .57	57.3 2.9	49.48 .26	58.4 1.9
July 8.6	17.37 .40	27.6 3.3	58.38 .24	44.7 1.2	29.96 .47	60.4 3.2	49.73 .24	56.6 1.8
18.6	17.72 +.30	31.0 +3.5	58.60 +.20	43.6 +1.0	30.38 +.36	63.7 +3.4	49.95 +.20	54.9 +1.6
28.6	17.97 .20	34.6 3.6	58.78 .16	42.8 0.7	30.69 .25	67.2 3.6	50.13 .16	53.4 1.5
Aug. 7.5	18.11 +.09	38.3 3.7	58.92 .12	42.2 0.5	30.88 +.13	70.9 3.7	50.27 .12	52.0 1.3
17.5	18.14 −.02	42.0 3.7	59.01 .07	41.8 +0.3	30.94 .00	74.6 3.7	50.37 .08	50.8 1.1
27.5	18.06 .13	45.6 3.6	59.06 +.03	41.7 0.0	30.88 −.12	78.3 3.6	50.43 +.03	49.9 0.8
Sept. 6.4	17.88 −.23	49.1 +3.4	59.06 −.02	41.8 −0.2	30.70 −.23	81.9 +3.5	50.44 −.01	49.2 +0.6
16.4	17.60 .33	52.4 3.2	59.03 .06	42.0 0.3	30.42 .34	85.3 3.3	50.42 .05	48.7 0.4
26.4	17.23 .41	55.5 2.9	58.95 .09	42.4 0.5	30.02 .44	88.5 3.0	50.35 .08	48.4 +0.2
Oct. 6.4	16.78 .48	58.2 2.5	58.85 .12	42.9 0.6	29.54 .53	91.3 2.6	50.26 .10	48.3 0.0
16.3	16.26 .54	60.4 2.0	58.72 .14	43.5 0.6	28.97 .60	93.7 2.2	50.14 .12	48.4 −0.2
26.3	15.70 −.59	62.2 +1.6	58.57 −.15	44.2 −0.6	28.35 −.65	95.7 +1.7	50.01 −.14	48.7 −0.3
Nov. 5.3	15.10 .61	63.5 1.0	58.42 .15	44.8 0.6	27.67 .69	97.2 1.2	49.87 .14	49.0 0.4
15.3	14.48 .62	64.2 +0.4	58.28 .15	45.4 0.6	26.97 .71	98.2 0.7	49.73 .14	49.6 0.6
25.2	13.85 .62	64.4 −0.1	58.14 .13	46.0 0.6	26.25 .71	98.5 +0.1	49.60 .13	50.2 0.7
Dec. 5.2	13.24 −.59	64.0 −0.8	58.01 −.12	46.5 −0.5	25.55 −.69	98.3 −0.6	49.47 −.12	50.8 −0.7
15.2	12.67 .55	62.9 1.3	57.90 .10	47.0 0.4	24.87 .65	97.4 1.1	49.36 .10	51.6 0.8
25.1	12.15 .49	61.3 1.9	57.82 .07	47.4 0.3	24.25 .59	96.0 1.7	49.27 .08	52.4 0.8
35.1	11.70 −.41	59.2 −2.4	57.76 −.05	47.6 −0.3	23.70 −.51	94.0 −2.2	49.20 −.06	53.2 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Gruis.		θ Aquarii.		π Aquarii.		η Aquarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 0	° ′ −47 31	h m 22 10	° ′ − 8 21	h m 22 19	° ′ + 0 47	h m 22 29	° ′ − 0 42
	s	″	s	″	s	″	s	″
Jan. 0.1	50.56 −.12	41.0 +1.2	39.54 −.07	51.5 −0.5	18.18 −.07	9.2 −0.9	20.75 −.08	66.8 −0.8
10.1	50.47 .08	39.6 1.6	39.48 .04	52.0 0.4	18.12 .05	8.4 0.8	20.68 .06	67.5 0.7
20.1	50.41 −.04	37.9 1.8	39.45 −.02	52.3 0.3	18.08 −.03	7.6 0.6	20.63 .04	68.2 0.7
30.1	50.40 +.01	36.0 2.1	39.44 +.01	52.6 −0.2	18.06 .00	6.9 0.7	20.60 −.01	68.9 0.6
Feb. 9.0	50.43 .06	33.8 2.3	39.46 .04	52.7 0.0	18.07 +.03	6.2 0.6	20.61 +.02	69.5 0.5
19.0	50.51 +.10	31.4 +2.4	39.52 +.07	52.6 +0.1	18.11 +.06	5.7 −0.4	20.64 +.05	69.9 −0.3
Mar. 1.0	50.63 .15	29.0 2.5	39.60 .10	52.4 0.3	18.18 .09	5.4 −0.2	20.70 .08	70.1 −0.1
11.0	50.80 .19	26.4 2.6	39.72 .13	52.0 0.6	18.29 .12	5.3 0.0	20.79 .11	70.1 +0.1
20.9	51.02 .24	23.8 2.6	39.86 .16	51.3 0.8	18.42 .15	5.5 +0.3	20.92 .14	69.8 0.4
30.9	51.27 .28	21.3 2.5	40.04 .19	50.4 1.0	18.59 .19	5.9 0.6	21.08 .18	69.3 0.7
Apr. 9.9	51.57 +.31	18.8 +2.4	40.25 +.22	49.2 +1.2	18.79 +.22	6.6 +0.9	21.27 +.21	68.5 +0.9
19.9	51.90 .35	16.5 2.3	40.49 .25	47.9 1.4	19.02 .24	7.6 1.1	21.50 .24	67.5 1.2
29.8	52.26 .38	14.3 2.1	40.75 .27	46.4 1.6	19.28 .27	8.9 1.4	21.75 .26	66.2 1.4
May 9.8	52.65 .40	12.4 1.8	41.04 .29	44.7 1.7	19.56 .29	10.4 1.6	22.02 .28	64.6 1.6
19.8	53.06 .41	10.7 1.5	41.33 .30	43.0 1.8	19.86 .30	12.1 1.8	22.32 .30	62.9 1.8
29.7	53.47 +.41	9.3 +1.2	41.64 +.31	41.1 +1.8	20.16 +.30	13.9 +1.9	22.62 +.31	61.1 +1.9
June 8.7	53.88 .41	8.3 0.8	41.95 .30	39.3 1.8	20.46 .30	15.8 2.0	22.92 .31	59.1 2.0
18.7	54.29 .39	7.6 0.5	42.25 .29	37.5 1.7	20.76 .29	17.8 2.0	23.23 .30	57.2 2.0
28.7	54.67 .37	7.4 +0.1	42.53 .27	35.8 1.6	21.04 .27	19.8 1.9	23.51 .28	55.2 1.9
July 8.6	55.02 .33	7.5 −0.3	42.80 .25	34.2 1.5	21.30 .25	21.7 1.9	23.78 .25	53.4 1.8
18.6	55.32 +.28	8.0 −0.7	43.02 +.21	32.8 +1.3	21.54 +.22	23.5 +1.7	24.02 +.22	51.6 +1.7
28.6	55.58 .23	8.9 1.0	43.22 .18	31.6 1.1	21.73 .18	25.2 1.6	24.23 .19	50.0 1.5
Aug. 7.5	55.78 .17	10.1 1.3	43.38 .14	30.6 0.9	21.89 .14	26.7 1.4	24.39 .15	48.6 1.3
17.5	55.92 .11	11.6 1.6	43.49 .09	29.9 0.6	22.01 .10	28.0 1.2	24.52 .11	47.4 1.1
27.5	56.00 +.04	13.3 1.8	43.56 +.05	29.4 0.4	22.08 .05	29.0 0.9	24.60 .06	46.4 0.9
Sept. 6.5	56.01 −.02	15.2 −1.9	43.58 .00	29.1 +0.2	22.12 +.01	29.8 +0.7	24.65 +.02	45.6 +0.6
16.4	55.96 .08	17.1 1.9	43.57 −.03	29.1 0.0	22.11 −.03	30.4 0.5	24.65 −.02	45.1 0.4
26.4	55.85 .13	19.1 1.9	43.52 .07	29.2 −0.2	22.06 .06	30.8 0.3	24.61 .05	44.8 +0.2
Oct. 6.4	55.70 .17	20.9 1.8	43.43 .10	29.4 0.4	21.98 .09	31.0 +0.1	24.55 .08	44.7 0.0
16.4	55.50 .21	22.6 1.6	43.32 .12	29.9 0.5	21.88 .11	31.0 −0.1	24.45 .10	44.8 −0.2
26.3	55.28 −.23	24.0 −1.3	43.20 −.13	30.4 −0.5	21.76 −.13	30.8 −0.3	24.34 −.12	45.1 −0.3
Nov. 5.3	55.04 .24	25.2 1.0	43.06 .14	31.0 0.6	21.63 .13	30.4 0.4	24.21 .13	45.4 0.5
15.3	54.80 .24	26.0 0.6	42.92 .14	31.6 0.6	21.50 .13	30.0 0.5	24.08 .13	46.0 0.6
25.2	54.56 .23	26.3 −0.2	42.78 .13	32.2 0.6	21.36 .13	29.4 0.6	23.95 .13	46.6 0.6
Dec. 5.2	54.34 −.21	26.3 +0.2	42.66 −.12	32.9 −0.6	21.24 −.12	28.7 −0.7	23.82 −.12	47.2 −0.7
15.2	54.15 .18	25.9 0.6	42.54 .10	33.5 0.6	21.12 .11	27.9 0.8	23.71 .11	48.0 0.8
25.2	53.99 .14	25.1 1.0	42.45 .08	34.1 0.6	21.02 .09	27.1 0.8	23.61 .09	48.8 0.8
35.1	53.86 −.11	24.0 +1.3	42.38 −.06	34.6 −0.5	20.94 −.07	26.3 −0.9	23.52 −.08	49.6 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	226 Cephei (B.)		ζ Pegasi.		ι Cephei.		λ Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	22h 30m	+75° 37′	22h 35m	+10° 13′	22h 45m	+65° 35′	22h 46m	− 8° 11′
	s	″	s	″	s	″	s	″
Jan. 0.2	12.00 −.71	48.6 −1.5	37.81 −.09	24.4 −1.1	30.92 −.39	29.6 −1.4	30.78 −.09	63.4 −0.5
10.1	11.33 .62	46.8 2.0	37.73 .07	23.3 1.1	30.54 .35	27.8 2.0	30.70 .07	63.9 0.4
20.1	10.76 .51	44.6 2.5	37.67 .05	22.1 1.2	30.22 .29	25.7 2.4	30.64 .05	64.2 0.3
30.1	10.31 .38	41.9 2.8	37.63 −.02	20.9 1.2	29.96 .22	23.1 2.7	30.60 −.02	64.5 −0.2
Feb. 9.1	10.00 .24	38.9 3.1	37.62 +.01	19.8 1.1	29.77 .14	20.2 3.0	30.59 .00	64.6 0.0
19.0	9.83 −.08	35.7 −3.2	37.65 +.04	18.8 −1.0	29.67 −.06	17.2 −3.1	30.61 +.03	64.5 +0.2
Mar. 1.0	9.84 +.08	32.5 3.2	37.70 .07	17.9 0.8	29.66 +.04	14.1 3.1	30.65 .06	64.2 0.4
11.0	10.00 .25	29.3 3.1	37.78 .10	17.3 0.5	29.75 .14	11.0 2.9	30.73 .09	63.8 0.6
20.9	10.33 .40	26.4 2.8	37.90 .14	16.9 −0.2	29.94 .23	8.2 2.7	30.84 .13	63.0 0.8
30.9	10.81 .55	23.8 2.4	38.06 .17	16.8 +0.1	30.21 .32	5.7 2.3	30.99 .16	62.1 1.1
Apr. 9.9	11.42 +.67	21.5 −2.0	38.25 +.21	17.0 +0.4	30.57 +.40	3.6 −1.9	31.16 +.20	60.9 +1.3
19.9	12.15 .78	19.8 1.5	38.47 .24	17.6 0.8	31.01 .47	1.9 1.4	31.38 .23	59.5 1.5
29.8	12.97 .86	18.6 0.9	38.73 .26	18.6 1.1	31.52 .53	0.8 0.8	31.62 .26	58.0 1.6
May 9.8	13.86 .91	18.0 −0.3	39.00 .28	19.8 1.4	32.07 .57	0.3 −0.2	31.89 .28	56.3 1.8
19.8	14.78 .93	18.1 +0.3	39.30 .30	21.3 1.6	32.65 .59	0.3 +0.4	32.18 .30	54.4 1.9
29.8	15.71 +.93	18.7 +0.9	39.60 +.31	23.0 +1.9	33.25 +.60	1.0 +0.9	32.48 +.31	52.5 +1.9
June 8.7	16.63 .90	19.9 1.5	39.91 .31	25.0 2.1	33.84 .59	2.2 1.5	32.79 .31	50.6 1.9
18.7	17.50 .84	21.6 2.0	40.21 .30	27.1 2.1	34.42 .56	3.9 2.0	33.10 .30	48.7 1.9
28.7	18.30 .76	23.9 2.5	40.50 .28	29.3 2.2	34.96 .52	6.2 2.5	33.39 .29	46.9 1.7
July 8.6	19.01 .66	26.5 2.9	40.77 .26	31.5 2.2	35.46 .46	8.8 2.8	33.67 .27	45.2 1.6
18.6	19.62 +.55	29.6 +3.2	41.02 +.23	33.6 +2.1	35.89 +.40	11.8 +3.1	33.93 +.24	43.7 +1.4
28.6	20.10 .43	32.9 3.4	41.22 .19	35.7 2.0	36.25 .33	15.0 3.4	34.15 .21	42.4 1.2
Aug. 7.6	20.46 .29	36.4 3.6	41.40 .15	37.7 1.9	36.54 .25	18.5 3.6	34.34 .17	41.3 0.9
17.5	20.68 .16	40.1 3.7	41.52 .11	39.5 1.7	36.74 .16	22.1 3.6	34.48 .12	40.5 0.7
27.5	20.77 +.02	43.8 3.7	41.61 .07	41.1 1.5	36.86 +.08	25.8 3.6	34.58 .08	40.0 0.4
Sept. 6.5	20.72 −.12	47.6 +3.7	41.66 +.02	42.5 +1.3	36.89 −.01	29.4 +3.6	34.64 +.04	39.6 +0.2
16.5	20.54 .25	51.2 3.5	41.66 −.01	43.7 1.1	36.84 .09	32.9 3.4	34.66 .00	39.6 0.0
26.4	20.22 .37	54.7 3.4	41.63 .05	44.6 0.8	36.71 .17	36.3 3.2	34.64 −.04	39.7 −0.2
Oct. 6.4	19.79 .48	57.9 3.1	41.57 .08	45.3 0.6	36.51 .24	39.4 2.9	34.59 .07	40.0 0.4
16.4	19.26 .59	60.8 2.7	41.48 .10	45.7 0.3	36.24 .30	42.1 2.6	34.51 .09	40.4 0.5
26.3	18.62 −.67	63.3 +2.3	41.36 −.12	45.9 +0.1	35.92 −.35	44.5 +2.2	34.40 −.11	41.0 −0.6
Nov. 5.3	17.92 .74	65.3 1.8	41.24 .13	45.9 −0.1	35.54 .39	46.5 1.7	34.28 .12	41.7 0.7
15.3	17.15 .79	66.8 1.3	41.11 .13	45.7 0.3	35.13 .42	48.0 1.2	34.16 .13	42.4 0.7
25.3	16.34 .82	67.8 0.7	40.97 .13	45.2 0.6	34.70 .44	48.9 0.6	34.03 .13	43.1 0.7
Dec. 5.2	15.52 −.82	68.2 +0.1	40.84 −.13	44.6 −0.7	34.25 −.45	49.2 +0.1	33.90 −.12	43.8 −0.7
15.2	14.71 .80	67.9 −0.6	40.72 .12	43.8 0.9	33.81 .44	49.0 −0.5	33.78 .11	44.5 0.7
25.2	13.92 .76	67.1 1.2	40.61 .10	42.8 1.0	33.37 .42	48.2 1.1	33.67 .10	45.1 0.6
35.2	13.20 −.69	65.6 −1.8	40.52 −.08	41.7 −1.2	32.97 −.39	46.8 −1.7	33.58 −.08	45.6 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Piscis Australis (*Fomalhaut.*)		α Pegasi. (*Markab.*)		o Cephei.		θ Piscium.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$22^{h}\ 51^{m}$	$-30^{\circ}\ 14'$	$22^{h}\ 58^{m}$	$+14^{\circ}\ 34'$	$23^{h}\ 13^{m}$	$+67^{\circ}\ 28'$	$23^{h}\ 22^{m}$	$+\ 5^{\circ}\ 44'$
	s	″	s	″	s	″	s	″
Jan. 0.2	10.94 −.12	34.6 +0.2	56.33 −.10	43.6 −1.1	50.01 −.45	41.2 −1.0	2.42 −.10	17.7 −0.9
10.2	10.84 .09	34.2 0.5	56.23 .09	42.4 1.2	49.57 .42	39.9 1.6	2.32 .09	16.8 0.9
20.1	10.76 .06	33.6 0.8	56.15 .07	41.2 1.3	49.17 .37	38.0 2.1	2.23 .08	15.9 0.9
30.1	10.70 .04	32.7 1.0	56.09 .05	39.8 1.3	48.84 .30	35.7 2.5	2.16 .06	15.0 0.8
Feb. 9.1	10.68 −.01	31.5 1.3	56.06 −.02	38.6 1.3	48.58 .22	33.0 2.8	2.11 .04	14.2 0.8
19.0	10.69 +.02	30.1 +1.5	56.06 +.01	37.3 −1.2	48.40 −.13	30.1 −3.0	2.09 −.01	13.5 −0.6
Mar. 1.0	10.74 .06	28.5 1.7	56.08 .04	36.2 1.0	48.32 −.03	27.1 3.1	2.10 +.02	13.0 0.5
11.0	10.82 .10	26.7 1.9	56.14 .08	35.3 0.8	48.34 +.07	24.0 3.0	2.14 .06	12.6 −0.3
21.0	10.93 .14	24.7 2.0	56.24 .12	34.7 0.5	48.47 .18	21.0 2.8	2.21 .09	12.5 0.0
30.9	11.09 .17	22.6 2.1	56.38 .15	34.3 −0.2	48.70 .28	18.3 2.3	2.32 .13	12.6 +0.3
Apr. 9.9	11.28 +.21	20.4 +2.2	56.55 +.19	34.3 +0.1	49.03 +.38	16.0 −2.2	2.47 +.17	13.0 +0.6
19.9	11.51 .25	18.2 2.3	56.76 .22	34.6 0.5	49.45 .46	14.0 1.7	2.65 .20	13.8 0.9
29.9	11.77 .28	16.0 2.2	57.00 .26	35.3 0.9	49.95 .53	12.6 1.2	2.87 .23	14.8 1.1
May 9.8	12.06 .30	13.7 2.2	57.27 .28	36.3 1.2	50.51 .59	11.7 −0.6	3.12 .26	16.0 1.4
19.8	12.38 .32	11.6 2.1	57.56 .30	37.7 1.5	51.12 .62	11.3 0.0	3.39 .29	17.6 1.6
29.8	12.71 +.34	9.6 +1.9	57.87 +.31	39.3 +1.7	51.75 +.64	11.6 +0.6	3.69 +.30	19.3 +1.8
June 8.7	13.05 .34	7.8 1.7	58.18 .31	41.2 2.0	52.40 .64	12.4 1.1	3.99 .31	21.2 2.0
18.7	13.40 .34	6.3 1.4	58.49 .31	43.2 2.1	53.04 .63	13.8 1.6	4.30 .31	23.2 2.0
28.7	13.73 .32	5.0 1.1	58.79 .29	45.4 2.2	53.65 .59	15.7 2.1	4.61 .30	25.2 2.1
July 8.7	14.04 .30	4.1 0.8	59.08 .27	47.7 2.3	54.21 .54	18.0 2.5	4.90 .28	27.3 2.0
18.6	14.33 +.27	3.5 +0.4	59.34 +.25	50.0 +2.3	54.73 +.48	20.7 +2.9	5.16 +.26	29.3 +2.0
28.6	14.59 .23	3.2 +0.1	59.56 .21	52.2 2.2	55.17 .41	23.8 3.2	5.41 .23	31.2 1.8
Aug. 7.6	14.80 .19	3.3 −0.2	59.76 .17	54.4 2.1	55.54 .33	27.1 3.4	5.62 .19	33.0 1.7
17.6	14.97 .14	3.7 0.6	59.91 .13	56.4 1.9	55.83 .25	30.6 3.6	5.79 .15	34.6 1.5
27.5	15.09 .10	4.4 0.8	60.02 .09	58.2 1.8	56.03 .16	34.2 3.6	5.92 .11	36.0 1.3
Sept. 6.5	15.16 +.05	5.4 −1.1	60.09 +.05	59.9 +1.5	56.14 +.07	37.8 +3.7	6.01 +.07	37.1 +1.0
16.5	15.18 .00	6.6 1.3	60.12 +.01	61.3 1.3	56.16 −.02	41.5 3.6	6.07 +.03	38.0 0.8
26.4	15.16 −.04	7.9 1.4	60.10 −.03	62.5 1.1	56.10 .11	45.0 3.4	6.08 .00	38.7 0.6
Oct. 6.4	15.10 .08	9.4 1.4	60.06 .06	63.5 0.8	55.95 .18	48.3 3.2	6.06 −.03	39.2 0.4
16.4	15.00 .11	10.8 1.4	59.99 .08	64.2 0.6	55.73 .25	51.3 2.9	6.01 .06	39.4 +0.1
26.4	14.88 −.14	12.2 −1.4	59.89 −.10	64.6 +0.3	55.44 −.32	54.0 +2.5	5.94 −.08	39.5 −0.1
Nov. 5.3	14.73 .15	13.5 1.2	59.78 .12	64.8 +0.1	55.09 .38	56.3 2.1	5.84 .10	39.3 0.2
15.3	14.57 .16	14.7 1.0	59.65 .13	64.7 −0.2	54.69 .42	58.2 1.6	5.74 .11	39.0 0.4
25.3	14.41 .16	15.6 0.8	59.52 .13	64.4 0.4	54.25 .45	59.5 1.1	5.62 .12	38.6 0.5
Dec. 5.3	14.25 −.15	16.3 −0.6	59.39 −.13	63.9 −0.6	53.79 −.47	60.3 +0.5	5.50 −.12	38.0 −0.7
15.2	14.10 .14	16.7 −0.3	59.26 .12	63.2 0.8	53.31 .48	60.5 −0.2	5.38 .12	37.2 0.8
25.2	13.97 .13	16.8 0.0	59.14 .12	62.3 1.0	52.83 .47	60.1 0.7	5.26 .11	36.5 0.8
35.2	13.85 −.11	16.7 +0.3	59.04 −.10	61.2 −1.2	52.37 −.45	59.0 −1.3	5.15 −.10	35.6 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Piscium.		γ Cephei.		Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$23^{h}\ 33^{m}$	$+\ 4^{\circ}\ 59'$	$23^{h}\ 34^{m}$	$+76^{\circ}\ 58'$	$23^{h}\ 49^{m}$	$+73^{\circ}\ 45'$	$23^{h}\ 53^{m}$	$+\ 6^{\circ}\ 12'$
	s	"	s	"	s	"	s	"
Jan. 0.2	56.45 −.11	38.4 −0.8	34.01 −.86	70.3 −0.6	10.45 −.67	57.6 −0.4	18.84 −.11	62.2 −0.8
10.2	56.35 .10	37.6 0.9	33.17 .81	69.4 1.2	9.79 .65	56.9 1.1	18.72 .11	61.4 0.8
20.2	56.26 .08	36.7 0.8	32.39 .74	67.9 1.8	9.16 .60	55.5 1.7	18.62 .10	60.5 0.8
30.1	56.18 .07	35.9 0.8	31.70 .63	65.9 2.3	8.60 .52	53.6 2.1	18.53 .08	59.7 0.8
Feb. 9.1	56.13 .05	35.1 0.7	31.13 .50	63.4 2.7	8.12 .43	51.2 2.5	18.46 .06	58.9 0.7
19.1	56.09 −.02	34.4 −0.6	30.70 −.35	60.6 −2.9	7.75 −.31	48.5 −2.9	18.41 −.04	58.2 −0.6
Mar. 1.1	56.09 +.01	33.9 0.4	30.44 −.18	57.5 3.1	7.50 .18	45.5 3.0	18.38 −.01	57.7 0.5
11.0	56.12 .05	33.6 −0.2	30.35 .00	54.4 3.1	7.39 −.04	42.4 3.1	18.39 +.03	57.3 −0.3
21.0	56.18 .08	33.5 0.0	30.44 +.19	51.3 3.1	7.43 +.11	39.4 3.0	18.44 .06	57.2 0.0
31.0	56.28 .12	33.7 +0.3	30.72 .37	48.3 2.9	7.62 .26	36.4 2.8	18.51 .10	57.2 +0.2
Apr. 9.9	56.42 +.16	34.1 +0.6	31.17 +.53	45.6 −2.5	7.94 +.40	33.7 −2.6	18.63 +.14	57.6 +0.5
19.9	56.59 .19	34.8 0.9	31.78 .68	43.2 2.1	8.41 .52	31.3 2.2	18.79 .18	58.2 0.8
29.9	56.80 .23	35.9 1.1	32.52 .81	41.3 1.6	8.99 .63	29.4 1.7	18.99 .21	59.2 1.1
May 9.9	57.05 .26	37.1 1.4	33.38 .91	39.9 1.1	9.67 .72	27.9 1.2	19.22 .25	60.4 1.3
19.8	57.32 .28	38.6 1.6	34.33 .98	39.1 −0.6	10.43 .79	26.9 0.7	19.48 .27	61.8 1.5
29.8	57.61 +.30	40.4 +1.8	35.34 1.02	38.8 0.0	11.24 +.84	26.6 −0.1	19.76 +.29	63.5 +1.8
June 8.8	57.91 .31	42.2 1.9	36.37 1.03	39.1 +0.6	12.09 .86	26.8 +0.5	20.06 .31	65.3 1.9
18.7	58.22 .31	44.2 2.0	37.40 1.02	40.0 1.2	12.95 .85	27.6 1.0	20.37 .31	67.2 2.0
28.7	58.53 .30	46.3 2.0	38.40 .97	41.5 1.7	13.79 .82	28.9 1.6	20.68 .31	69.3 2.0
July 8.7	58.82 .29	48.3 2.0	39.34 .90	43.5 2.2	14.59 .78	30.7 2.1	20.98 .29	71.3 2.0
18.7	59.10 +.26	50.2 +1.9	40.20 +.82	45.8 +2.6	15.34 +.71	33.0 +2.5	21.27 +.27	73.3 +2.0
28.6	59.35 .24	52.1 1.8	40.96 .71	48.6 3.0	16.01 .63	35.6 2.9	21.53 .25	75.2 1.8
Aug. 7.6	59.57 .20	53.8 1.6	41.62 .59	51.8 3.3	16.60 .54	38.7 3.2	21.76 .22	77.0 1.7
17.6	59.75 .16	55.4 1.4	42.14 .45	55.2 3.5	17.08 .43	42.0 3.4	21.96 .18	78.6 1.5
27.6	59.90 .12	56.7 1.2	42.52 .31	58.8 3.7	17.46 .32	45.5 3.6	22.12 .14	80.0 1.3
Sept. 6.5	60.00 +.08	57.8 +1.0	42.77 +.17	62.5 +3.7	17.72 +.21	49.1 +3.7	22.24 +.10	81.2 +1.1
16.5	60.07 .05	58.7 0.8	42.87 +.03	66.2 3.7	17.87 +.09	52.8 3.7	22.33 .07	82.1 0.8
26.5	60.10 +.01	59.4 0.5	42.83 −.12	69.9 3.6	17.90 −.02	56.5 3.6	22.38 +.03	82.9 0.6
Oct. 6.4	60.09 −.02	59.8 0.3	42.64 .25	73.5 3.5	17.82 .14	60.0 3.5	22.39 .00	83.4 0.4
16.4	60.05 .05	60.0 +0.1	42.32 .39	76.9 3.3	17.63 .25	63.4 3.3	22.37 −.03	83.6 +0.2
26.4	59.99 −.07	60.0 −0.1	41.87 −.51	80.0 +3.0	17.33 −.35	66.6 +3.0	22.32 −.06	83.7 0.0
Nov. 5.4	59.90 .09	59.8 0.3	41.30 .62	82.8 2.6	16.93 .44	69.4 2.6	22.25 .08	83.6 −0.2
15.3	59.80 .11	59.4 0.4	40.64 .71	85.2 2.1	16.45 .52	71.8 2.2	22.17 .10	83.3 0.4
25.3	59.69 .11	58.9 0.6	39.88 .79	87.0 1.6	15.89 .59	73.7 1.7	22.06 .11	82.9 0.5
Dec. 5.3	59.58 −.12	58.3 −0.7	39.06 −.85	88.3 +1.0	15.28 −.64	75.1 +1.1	21.95 −.11	82.3 −0.6
15.3	59.46 .12	57.6 0.8	38.19 .88	89.0 +0.4	14.62 .68	75.9 +0.5	21.84 .12	81.6 0.7
25.2	59.34 .11	56.8 0.8	37.31 .88	89.1 −0.2	13.93 .69	76.1 −0.1	21.72 .12	80.9 0.8
35.2	59.23 −.11	56.0 −0.9	36.44 −.86	88.5 −0.8	13.25 −.68	75.7 −0.7	21.60 −.11	80.1 −0.8

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 47 52.69	53.40	−22 59 46.4	45.6	11.036	+12.62	+ 3 51.18	16 18.38	1 11.07	18 44 1.59
2	18 52 17.41	18.20	22 54 29.6	28.6	11.023	13.77	4 19.34	16 18.37	1 11.02	18 47 58.15
3	18 56 41.77	42.65	22 48 45.4	44.2	11.008	14.91	4 47.15	16 18.36	1 10.97	18 51 54.71
4	19 1 5.76	6.72	22 42 34.0	32.6	10.991	16.04	5 14.59	16 18.34	1 10.92	18 55 51.27
5	19 5 29.35	30.39	22 35 55.6	54.0	10.974	17.16	5 41.62	16 18.32	1 10.86	18 59 47.83
6	19 9 52.50	53.62	−22 28 50.3	48.4	10.955	+18.27	+ 6 8.21	16 18.29	1 10.80	19 3 44.38
7	19 14 15.19	16.39	22 21 18.4	16.3	10.935	19.37	6 34.34	16 18.26	1 10.73	19 7 40.94
8	19 18 37.38	38.65	22 13 20.1	17.7	10.914	20.47	6 59.99	16 18.23	1 10.66	19 11 37.49
9	19 22 59.04	60.38	22 4 55.7	53.1	10.891	21.56	7 25.11	16 18.19	1 10.59	19 15 34.05
10	19 27 20.15	21.56	21 56 5.4	2.5	10.867	22.63	7 49.67	16 18.15	1 10.51	19 19 30.61
11	19 31 40.67	42.15	−21 46 49.5	46.3	10.842	+23.69	+ 8 13.64	16 18.10	1 10.43	19 23 27.17
12	19 36 0.58	2.13	21 37 8.2	4.7	10.816	24.74	8 37.00	16 18.05	1 10.35	19 27 23.72
13	19 40 19.85	21.47	21 26 61.9	58.1	10.789	25.78	8 59.71	16 18.00	1 10.27	19 31 20.28
14	19 44 38.46	40.14	21 16 30.8	26.6	10.761	26.80	9 21.76	16 17.94	1 10.18	19 35 16.84
15	19 48 56.39	58.13	21 5 35.3	30.8	10.732	27.81	9 43.13	16 17.88	1 10.09	19 39 13.40
16	19 53 13.61	15.41	−20 54 15.7	10.8	10.703	+28.81	+10 3.80	16 17.81	1 9.99	19 43 9.95
17	19 57 30.12	31.97	20 42 32.2	27.0	10.673	29.80	10 23.75	16 17.74	1 9.89	19 47 6.51
18	20 1 45.89	47.79	20 30 25.3	19.8	10.642	30.77	10 42.97	16 17.66	1 9.79	19 51 3.06
19	20 6 0.92	2.87	20 17 55.2	49.4	10.611	31.73	11 1.44	16 17.58	1 9.69	19 54 59.62
20	20 10 15.19	17.19	20 4 62.2	56.0	10.579	32.67	11 19.15	16 17.49	1 9.59	19 58 56.18
21	20 14 28.69	30.73	−19 51 46.7	40.2	10.547	+33.60	+11 36.09	16 17.40	1 9.49	20 2 52.74
22	20 18 41.42	43.50	19 38 9.1	2.3	10.514	34.52	11 52.26	16 17.30	1 9.38	20 6 49.29
23	20 22 53.36	55.48	19 24 9.7	2.6	10.481	35.42	12 7.64	16 17.19	1 9.27	20 10 45.85
24	20 27 4.52	6.67	19 9 48.8	41.3	10.448	36.31	12 22.23	16 17.08	1 9.16	20 14 42.40
25	20 31 14.88	17.06	18 54 66.8	59.0	10.415	37.18	12 36.04	16 16.96	1 9.05	20 18 38.96
26	20 35 24.46	26.67	−18 39 64.0	55.9	10.382	+38.04	+12 49.06	16 16.84	1 8.94	20 22 35.51
27	20 39 33.24	35.48	18 24 40.8	32.4	10.349	38.88	13 1.28	16 16.71	1 8.83	20 26 32.07
28	20 43 41.22	43.49	18 8 57.6	48.8	10.316	39.71	13 12.70	16 16.57	1 8.71	20 30 28.62
29	20 47 48.40	50.69	17 52 54.8	45.7	10.283	40.52	13 23.32	16 16.43	1 8.60	20 34 25.18
30	20 51 54.79	57.10	17 36 32.7	23.3	10.249	41.31	13 33.14	16 16.28	1 8.48	20 38 21.73
31	20 56 0.37	2.70	−17 19 51.9	42.2	10.216	+42.08	+13 42.16	16 16.13	1 8.37	20 42 18.29
Feb. 1	21 0 5.14	7.49	17 2 52.6	42.7	10.182	42.84	13 50.37	16 15.98	1 8.25	20 46 14.84
2	21 4 9.11	11.47	16 45 35.4	25.2	10.149	43.58	13 57.78	16 15.82	1 8.13	20 50 11.40
3	21 8 12.27	14.64	16 27 60.6	50.2	10.115	44.31	14 4.38	16 15.66	1 8.01	20 54 7.95
4	21 12 14.63	17.01	16 9 68.6	58.0	10.082	45.01	14 10.17	16 15.50	1 7.90	20 58 4.51
5	21 16 16.19	18.58	−15 51 59.8	49.0	10.048	+45.71	+14 15.16	16 15.33	1 7.78	21 2 1.06
6	21 20 16.94	19.34	15 33 34.7	23.7	10.015	46.38	14 19.35	16 15.16	1 7.67	21 5 57.62
7	21 24 16.90	19.29	15 14 53.7	42.5	9.981	47.03	14 22.74	16 14.99	1 7.55	21 9 54.17
8	21 28 16.05	18.44	14 55 57.3	45.9	9.948	47.66	14 25.33	16 14.82	1 7.44	21 13 50.73
9	21 32 14.40	16.79	14 36 45.9	34.3	9.915	48.28	14 27.13	16 14.64	1 7.33	21 17 47.28
10	21 36 11.96	14.34	−14 17 19.9	8.1	9.882	+48.88	+14 28.12	16 14.46	1 7.22	21 21 43.84
11	21 40 8.72	11.09	13 57 39.7	27.8	9.849	49.46	14 28.33	16 14.28	1 7.11	21 25 40.39
12	21 44 4.71	7.07	13 37 45.9	33.8	9.816	50.02	14 27.75	16 14.09	1 7.00	21 29 36.95
13	21 47 59.92	62.27	13 17 38.7	26.5	9.784	50.57	14 26.40	16 13.90	1 6.90	21 33 33.50
14	21 51 54.36	56.70	12 57 18.7	6.4	9.753	51.09	14 24.29	16 13.71	1 6.79	21 37 30.05
15	21 55 48.05	50.37	−12 36 46.2	33.8	9.722	+51.60	+14 21.41	16 13.51	1 6.69	21 41 26.60
16	21 59 40.99	43.30	−12 15 61.7	49.2	9.691	+52.10	+14 17.78	16 13.31	1 6.58	21 45 23.16

Note.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Feb. 16	21 59 40.99	43.30	−12 15 61.7	49.2	9.691	+52.10	+14 17.78	16 13.31	1 6.58	21 45 23.16
17	22 3 33.21	35.50	11 54 65.5	53.0	9.661	52.58	14 13.45	16 13.11	1 6.48	21 49 19.71
18	22 7 24.71	26.98	11 33 58.1	45.6	9.632	53.04	14 8.40	16 12.90	1 6.38	21 53 16.26
19	22 11 15.51	17.76	11 12 39.8	27.3	9.603	53.48	14 2.64	16 12.69	1 6.28	21 57 12.81
20	22 15 5.63	7.86	10 50 71.1	58.6	9.575	53.91	13 56.20	16 12.48	1 6.18	22 1 9.37
21	22 18 55.09	57.29	−10 29 32.3	19.8	9.548	+54.32	+13 49.10	16 12.26	1 6.09	22 5 5.92
22	22 22 43.91	46.09	10 7 43.8	31.3	9.522	54.71	13 41.36	16 12.04	1 6.00	22 9 2.48
23	22 26 32.10	34.25	9 45 46.1	33.6	9.496	55.09	13 32.99	16 11.81	1 5.91	22 12 59.03
24	22 30 19.68	21.80	9 23 39.4	27.0	9.471	55.45	13 24.02	16 11.58	1 5.82	22 16 55.58
25	22 34 6.68	8.77	9 1 24.2	11.9	9.447	55.80	13 14.46	16 11.34	1 5.74	22 20 52.13
26	22 37 53.11	55.17	− 8 38 60.9	48.7	9.424	+56.13	+13 4.33	16 11.10	1 5.66	22 24 48.69
27	22 41 39.00	41.02	8 16 29.8	17.7	9 401	56.45	12 53.67	16 10.86	1 5.58	22 28 45.24
28	22 45 24.37	26.36	7 53 51.4	39.4	9.380	56.74	12 42.49	16 10.61	1 5.50	22 32 41.79
Mar. 1	22 49 9.23	11.18	7 30 66.1	54.2	9.359	57.02	12 30.79	16 10.36	1 5.42	22 36 38.34
2	22 52 53.60	55.52	7 8 14.3	2.5	9.339	57.29	12 18.60	16 10.11	1 5.34	22 40 34.90
3	22 56 37.51	39.39	− 6 45 16.2	4.6	9.320	+57.54	+12 5.96	16 9.85	1 5.27	22 44 31.45
4	23 0 20.97	22.81	6 22 12.4	0.9	9.302	57.77	11 52.87	16 9.60	1 5.20	22 48 28.00
5	23 4 3.98	5.78	5 58 63.3	52.0	9.284	57.98	11 39.32	16 9.34	1 5.14	22 52 24.55
6	23 7 46.58	48.34	5 35 49.3	38.2	9.267	58.18	11 25.36	16 9.09	1 5.08	22 56 21.11
7	23 11 28.77	30.49	5 12 30.7	19.8	9.250	58.36	11 11.00	16 8.83	1 5.02	23 0 17.66
8	23 15 10.57	12.25	− 4 48 68.0	57.3	9.234	+58.52	+10 56.25	16 8.57	1 4.96	23 4 14.21
9	23 18 52.01	53.65	4 25 41.6	31.1	9.219	58.67	10 41.13	16 8.31	1 4.91	23 8 10.76
10	23 22 33.09	34.69	4 2 11.9	1.6	9.205	58.80	10 25.66	16 8.05	1 4.86	23 12 7.32
11	23 26 13.83	15.39	3 38 39.3	29.3	9.191	58.91	10 9.85	16 7.79	1 4.81	23 16 3.87
12	23 29 54.25	55.77	3 14 64.2	54.4	9.178	59.01	9 53.72	16 7.53	1 4.77	23 20 0.42
13	23 33 34.36	35.83	− 2 51 26.9	17.4	9.165	+59.09	+ 9 37.28	16 7.27	1 4.73	23 23 56.97
14	23 37 14.18	15.61	2 27 47.9	38.6	9.154	59.15	9 20.54	16 7.01	1 4.69	23 27 53.53
15	23 40 53.74	55.12	2 3 67.5	58.5	9.143	59.20	9 3.55	16 6.75	1 4.66	23 31 50.08
16	23 44 33.05	34.38	1 40 26.1	17.4	9.133	59.24	8 46.31	16 6.49	1 4.63	23 35 46.63
17	23 48 12.12	13.41	1 16 44.0	35.6	9.124	59.26	8 28.84	16 6.22	1 4.60	23 39 43.18
18	23 51 50.99	52.24	− 0 52 61.6	53.5	9.116	+59.26	+ 8 11.16	16 5.96	1 4.57	23 43 39.73
19	23 55 29.67	30.87	0 29 19.3	11.5	9.108	59.25	7 53.29	16 5.69	1 4.55	23 47 36.28
20	23 59 8.19	9.34	− 0 5 37.4	29.9	9.102	59.23	7 35.25	16 5.42	1 4.53	23 51 32.84
21	0 2 46.57	47.68	+ 0 18 3.6	10.8	9.097	59.19	7 17.09	16 5.15	1 4.51	23 55 29.39
22	0 6 24.84	25.90	0 41 43.6	50.5	9.093	59.14	6 58.81	16 4.88	1 4.49	23 59 25.94
23	0 10 3.01	4.03	+ 1 5 22.2	28.8	9.089	+59.07	+ 6 40.44	16 4.60	1 4.48	0 3 22.49
24	0 13 41.12	42.09	1 28 59.0	65.3	9.087	58.99	6 21.99	16 4.33	1 4.47	0 7 19.05
25	0 17 19.18	20.10	1 52 33.7	39.7	9.085	58.90	6 3.50	16 4.05	1 4.47	0 11 15.60
26	0 20 57.22	58.09	2 16 6.0	11.7	9.085	58.79	5 44.99	16 3.77	1 4.46	0 15 12.15
27	0 24 35.26	36.09	2 39 35.4	40.8	9.085	58.66	5 26.49	16 3.49	1 4.46	0 19 8.70
28	0 28 13.33	14.11	+ 3 3 1.7	6.8	9.087	+58.52	+ 5 8.01	16 3.21	1 4.46	0 23 5.26
29	0 31 51.45	52.18	3 26 24.5	29.2	9.090	58.37	4 49.58	16 2.92	1 4.47	0 27 1.81
30	0 35 29.64	30.32	3 49 43.5	47.9	9.093	58.20	4 31.22	16 2.64	1 4.48	0 30 58 36
31	0 39 7.92	8.56	4 12 58.3	62.4	9.097	58.02	4 12.96	16 2.36	1 4.49	0 34 54.91
32	0 42 46.31	46.90	4 36 8.6	12.4	9.102	57.82	3 54.80	16 2.08	1 4.51	0 38 51.47
33	0 46 24.83	25.37	+ 4 59 14.0	17.5	9.108	+57.61	+ 3 36.77	16 1.79	1 4.53	0 42 48.02
34	0 50 3.49	3.99	+ 5 22 14.1	17.3	9.115	+57.39	+ 3 18.88	16 1.51	1 4.55	0 46 44.57

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 42 46.31	46.90	+ 4 36 8.6	12.4	9.102	+57.82	+ 3 54.80	16 2.08	1 4.51	0 38 51.47
2	0 46 24.83	25.37	4 59 14.0	17.5	9.108	57.61	3 36.77	16 1.79	1 4.53	0 42 48.02
3	0 50 3.49	3.99	5 22 14.1	17.3	9.115	57.39	3 18.88	16 1.51	1 4.55	0 46 44.57
4	0 53 42.32	42.78	5 45 8.7	11.6	9.122	57.15	3 1.16	16 1.23	1 4.57	0 50 41.12
5	0 57 21.32	21.74	6 7 57.3	59.9	9.130	56.90	2 43.62	16 0.95	1 4.59	0 54 37.67
6	1 1 0.52	0.89	+ 6 30 39.6	41.9	9.138	+56.63	+ 2 26.27	16 0.67	1 4.62	0 58 34.22
7	1 4 39.92	40.24	6 53 15.2	17.2	9.147	56.34	2 9.12	16 0.39	1 4.65	1 2 30.78
8	1 8 19.54	19.82	7 15 43.7	45.4	9.156	56.04	1 52.19	16 0.12	1 4.69	1 6 27.33
9	1 11 59.40	59.64	7 38 4.8	6.2	9.166	55.72	1 35.51	15 59.85	1 4.73	1 10 23.88
10	1 15 39.52	39.72	8 0 18.1	19.3	9.177	55.39	1 19.08	15 59.58	1 4.77	1 14 20.43
11	1 19 19.90	20.06	+ 8 22 23.4	24.3	9.188	+55.04	+ 1 2.90	15 59.31	1 4.81	1 18 16.99
12	1 23 0.55	0.67	8 44 20.2	20.9	9.200	54.68	0 47.00	15 59.05	1 4.86	1 22 13.54
13	1 26 41.49	41.57	9 6 8.2	8.6	9.212	54.31	0 31.40	15 58.79	1 4.90	1 26 10.09
14	1 30 22.74	22.78	9 27 47.0	47.2	9.225	53.92	0 16.10	15 58.53	1 4.95	1 30 6.64
15	1 34 4.31	4.31	9 49 16.3	16.3	9.239	53.52	+ 0 1.12	15 58.27	1 5.00	1 31 3.19
16	1 37 46.21	46.17	+10 10 35.8	35.6	9.253	+53.10	− 0 13.53	15 58.01	1 5.06	1 37 59.74
17	1 41 28.47	28.39	10 31 45.3	44.9	9.268	52.67	0 27.83	15 57.75	1 5.11	1 41 56.30
18	1 45 11.09	10.98	10 52 44.3	43.8	9.284	52.23	0 41.75	15 57.49	1 5.17	1 45 52.85
19	1 48 54.10	53.95	11 13 32.6	31.9	9.301	51.78	0 55.29	15 57.23	1 5.23	1 49 49.41
20	1 52 37.52	37.34	11 34 9.8	8.9	9.318	51.31	1 8.43	15 56.98	1 5.29	1 53 45.96
21	1 56 21.36	21.15	+11 54 35.6	34.5	9.336	+50.83	− 1 21.15	15 56.72	1 5.35	1 57 42.52
22	2 0 5.63	5.39	12 14 49.7	48.4	9.354	50.33	1 33.43	15 56.47	1 5.42	2 1 39.07
23	2 3 50.36	50.09	12 34 51.8	50.3	9.373	49.82	1 45.25	15 56.21	1 5.48	2 5 35.62
24	2 7 35.55	35.25	12 54 41.4	39.8	9.393	49.30	1 56.61	15 55.96	1 5.55	2 9 32.17
25	2 11 21.22	20.89	13 14 18.4	16.7	9.414	48.77	2 7.49	15 55.70	1 5.62	2 13 28.73
26	2 15 7.40	7.04	+13 33 42.4	40.6	9.435	+48.22	− 2 17.86	15 55.45	1 5.69	2 17 25.28
27	2 18 54.09	53.70	13 52 53.2	51.3	9.457	47.66	2 27.73	15 55.20	1 5.76	2 21 21.84
28	2 22 41.30	40.88	14 11 50.3	48.3	9.479	47.09	2 37.08	15 54.95	1 5.84	2 25 18.39
29	2 26 29.04	28.60	14 30 33.5	31.4	9.501	46.50	2 45.89	15 54.70	1 5.91	2 29 14.95
30	2 30 17.33	16.87	14 49 2 4	0.2	9.524	45.90	2 54.15	15 54.45	1 5.99	2 33 11.50
May 1	2 34 6.17	5.69	+15 7 16.8	14.5	9.547	+45.29	− 3 1.87	15 54.21	1 6.07	2 37 8.06
2	2 37 55.56	55.06	15 25 16.2	13.8	9.570	44.66	3 9.03	15 53.97	1 6.15	2 41 4.61
3	2 41 45.52	45.00	15 42 60.4	57.9	9.593	44.02	3 15.63	15 53.73	1 6.23	2 45 1.17
4	2 45 36.04	35.50	16 0 29.1	26.6	9.617	43.36	3 21.67	15 53.50	1 6.31	2 48 57.72
5	2 49 27.13	26.57	16 17 41.9	39.4	9.640	42.69	3 27.14	15 53.27	1 6.39	2 52 54.28
6	2 53 18.79	18.22	+16 34 38.5	36.0	9.664	+42.01	− 3 32.04	15 53.05	1 6.47	2 56 50.83
7	2 57 11.01	10.43	16 51 18.6	16.1	9.687	41.32	3 36.37	15 52.83	1 6.55	3 0 47.39
8	3 1 3.80	3.21	17 7 41.8	39.3	9.711	40.61	3 40.13	15 52.61	1 6.63	3 4 43.94
9	3 4 57.15	56.55	17 23 47.9	45.4	9.734	39.89	3 43.33	15 52.40	1 6.71	3 8 40.50
10	3 8 51.07	50.46	17 39 36.6	34.1	9.758	39.16	3 45.97	15 52.19	1 6.79	3 12 37.05
11	3 12 45.55	44.93	+17 55 7.5	5.0	9.781	+38.41	− 3 48.05	15 51.98	1 6.87	3 16 33.61
12	3 16 40.59	39.96	18 10 20.4	17.9	9.805	37.65	3 49.57	15 51.78	1 6.96	3 20 30.16
13	3 20 36.18	35.55	18 25 14.9	12.5	9.828	36.88	3 50.54	15 51.58	1 7.04	3 24 26.72
14	3 24 32.33	31.70	18 39 50.8	48.5	9.851	36.10	3 50.95	15 51.39	1 7.12	3 28 23.27
15	3 28 29.03	28.40	18 54 7.9	5.6	9.874	35.31	3 50.80	15 51.19	1 7.20	3 32 19.83
16	3 32 26.29	25.66	+19 8 5.9	3.7	9.897	+34.51	− 3 50.09	15 51.00	1 7.29	3 36 16.38
17	3 36 24.09	23.46	+19 21 44.4	42.2	9.920	+33.70	− 3 48.84	15 50 81	1 7.37	3 40 12.94

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 36 24.09	23.46	+19 21 44.4	42.2	9.920	+33.70	− 3 48.84	15 50.81	1 7.37	3 40 12.94
18	3 40 22.44	21.81	19 35 3.2	1.1	9.943	32.87	3 47.05	15 50.63	1 7.45	3 44 9.49
19	3 44 21.33	20.70	19 48 2.0	0.0	9.966	32.03	3 44.72	15 50.45	1 7.53	3 48 6.05
20	3 48 20.76	20.14	20 0 40.7	38.8	9.988	31.18	3 41.85	15 50.27	1 7.61	3 52 2.60
21	3 52 20.73	20.12	20 12 58.8	57.0	10.010	30.33	3 38.43	15 50.09	1 7.69	3 55 59.15
22	3 56 21.23	20.63	+20 24 56.3	54.5	10.032	+29.46	− 3 34.48	15 49.91	1 7.76	3 59 55.70
23	4 0 22.27	21.68	20 36 32.8	31.1	10.054	28.58	3 30.00	15 49.74	1 7.84	4 3 52.26
24	4 4 23.84	23.26	20 47 48.1	46.5	10.076	27.69	3 24.99	15 49.57	1 7.91	4 7 48.82
25	4 8 25.92	25.36	20 58 42.1	40.6	10.098	26.79	3 19.46	15 49.40	1 7.98	4 11 45.38
26	4 12 28.52	27.97	21 9 14.4	13.0	10.119	25.89	3 13.42	15 49.24	1 8.05	4 15 41.93
27	4 16 31.62	31.09	+21 19 24.9	23.7	10.139	+24.97	− 3 6.88	15 49.08	1 8.12	4 19 38.49
28	4 20 35.21	34.70	21 29 13.4	12.2	10.159	24.05	2 59.85	15 48.92	1 8.18	4 23 35.05
29	4 24 39.28	38.79	21 38 39.5	38.4	10.179	23.12	2 52.34	15 48.77	1 8.24	4 27 31.61
30	4 28 43.81	43.34	21 47 43.2	42.2	10.198	22.18	2 44.36	15 48.62	1 8.30	4 31 28.16
31	4 32 48.79	48.35	21 56 24.2	23.3	10.217	21.23	2 35.93	15 48.47	1 8.36	4 35 24.72
June 1	4 36 54.22	53.80	+22 4 42.4	41.6	10.235	+20.27	− 2 27.06	15 48.33	1 8.42	4 39 21.27
2	4 40 60.06	59.66	22 12 37.5	36.8	10.252	19.31	2 17.78	15 48.19	1 8.47	4 43 17.83
3	4 45 6.29	5.92	22 20 9.4	8.8	10.268	18.34	2 8.10	15 48.06	1 8.52	4 47 14.38
4	4 49 12.89	12.55	22 27 17.9	17.4	10.283	17.36	1 58.06	15 47.93	1 8.57	4 51 10.94
5	4 53 19.85	19.54	22 34 2.9	2.4	10.297	16.38	1 47.66	15 47.81	1 8.62	4 55 7.50
6	4 57 27.13	26.85	+22 40 24.2	23.8	10.310	+15.39	− 1 36.94	15 47.70	1 8.66	4 59 4.06
7	5 1 34.72	34.47	22 46 21.7	21.4	10.322	14.39	1 25.90	15 47.59	1 8.70	5 3 0.61
8	5 5 42.58	42.36	22 51 55.2	54.9	10.333	13.39	1 14.60	15 47.48	1 8.74	5 6 57.17
9	5 9 50.70	50.52	22 57 4.7	4.5	10.343	12.38	1 3.04	15 47.38	1 8.78	5 10 53.73
10	5 13 59.06	58 91	23 1 50.0	49.8	10.352	11.37	0 51.24	15 47.28	1 8.81	5 14 50.29
11	5 18 7.64	7.52	+23 6 10.9	10.8	10.361	+10.36	− 0 39.22	15 47.19	1 8.84	5 18 46.84
12	5 22 16.39	16.31	23 10 7.5	7.4	10.368	9.34	0 27.02	15 47.10	1 8.87	5 22 43.40
13	5 26 25.31	25.27	23 13 39.6	39.6	10.375	8.32	0 14.65	15 47.02	1 8.90	5 26 39.96
14	5 30 34.37	34.36	23 16 47.2	47.2	10.380	7.30	− 0 2.15	15 46 94	1 8.92	5 30 36.52
15	5 34 43.55	43.58	23 19 30.1	30.1	10.385	6.27	+ 0 10.48	15 46.87	1 8.94	5 34 33 07
16	5 38 52.83	52.89	+23 21 48.3	48.3	10.388	+ 5.25	+ 0 23.20	15 46.80	1 8.96	5 38 29.63
17	5 43 2.19	2.29	23 23 41.9	41.9	10.391	4.22	0 36.01	15 46.73	1 8 97	5 42 26.19
18	5 47 11.61	11.74	23 25 10.8	10.8	10.393	3.19	0 48.87	15 46 66	1 8.98	5 46 22.75
19	5 51 21.07	21.24	23 26 14.8	14.8	10.395	2.15	1 1.78	15 46.60	1 8.98	5 50 19.30
20	5 55 30.55	30.76	23 26 54.1	54.1	10.395	1.12	1 14.70	15 46.54	1 8.98	5 54 15.86
21	5 59 40.03	40.28	+23 27 8.5	8.5	10.395	+ 0.08	+ 1 27.63	15 46.49	1 8.98	5 58 12.41
22	6 3 49.49	49.78	23 26 58.1	58.1	10.394	− 0.95	1 40.53	15 46.44	1 8.98	6 2 8.97
23	6 7 58.91	59.23	23 26 22.9	22.8	10.392	1.98	1 53.40	15 46.39	1 8.97	6 6 5.52
24	6 12 8.27	8.63	23 25 22 9	22.7	10.389	3.01	2 6.20	15 46.34	1 8.96	6 10 2.08
25	6 16 17.55	17.95	23 23 58.1	57.9	10.385	4.04	2 18.93	15 46.30	1 8.94	6 13 58.64
26	6 20 26.73	27.17	+23 22 8 6	8.4	10 380	− 5.07	+ 2 31.55	15 46.26	1 8.92	6 17 55.20
27	6 24 35.79	36.26	23 19 54.5	54.2	10.374	6.10	2 44.05	15 46.23	1 8.90	6 21 51.76
28	6 28 44.70	45.21	23 17 15.8	15.5	10.367	7.13	2 56.41	15 46.20	1 8.88	6 25 48.32
29	6 32 53.45	53.99	23 14 12.5	12.1	10.360	8.15	3 8.61	15 46.18	1 8.85	6 29 44 87
30	6 37 2.00	2.58	23 10 44.7	44.2	10.351	9.17	3 20.60	15 46.16	1 8.82	6 33 41.43
31	6 41 10.34	10.95	+23 6 52.6	52.0	10.342	−10.18	+ 3 32.38	15 46.15	1 8.78	6 37 37.99
32	6 45 18.43	19.07	+23 2 36.2	35.5	10.331	−11.19	+ 3 43.92	15 46.14	1 8.74	6 41 34.55

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 41 10.34	10.95	+23 6 52.6	52.0	10.342	−10.18	+ 3 32.38	15 46.15	1 8.78	6 37 37.99
2	6 45 18.43	19.07	23 2 36.2	35.5	10.331	11.19	3 43.92	15 46.14	1 8.74	6 41 34.55
3	6 49 26.26	26 93	22 57 55.7	54.9	10.320	12.19	3 55.19	15 46.14	1 8.70	6 45 31.10
4	6 53 33.79	34.49	22 52 51.1	50.2	10.307	13.19	4 6.16	15 46.14	1 8.66	6 49 27.66
5	6 57 41.02	41.75	22 47 22.7	21.7	10.294	14.18	4 16.83	15 46.15	1 8.62	6 53 24.21
6	7 1 47.90	48.66	+22 41 30.5	29.4	10.279	−15.17	+ 4 27.16	15 46.16	1 8.57	6 57 20.77
7	7 5 54.42	55.21	22 35 14.7	13.5	10.264	16.15	4 37.12	15 46.18	1 8.52	7 1 17.33
8	7 10 0.55	1.37	22 28 35.5	34.2	10.247	17.12	4 46.69	15 46.21	1 8.47	7 5 13.89
9	7 14 6.28	7.12	22 21 33.0	31.6	10.230	18.09	4 55.86	15 46.24	1 8.41	7 9 10.44
10	7 18 11.58	12.45	22 14 7.4	5.9	10.212	19.05	5 4.61	15 46.28	1 8.35	7 13 7.00
11	7 22 16.43	17.32	+22 6 18.8	17.2	10.193	−20.00	+ 5 12.91	15 46.32	1 8.29	7 17 3.55
12	7 26 20.82	21.73	21 58 7.6	5.8	10.173	20.94	5 20.74	15 46.37	1 8.23	7 21 0.11
13	7 30 24.73	25.66	21 49 33.7	31.8	10 153	21.87	5 28.09	15 46.42	1 8.16	7 24 56.67
14	7 34 28.15	29.10	21 40 37.5	35.5	10.132	22.79	5 34.95	15 46.47	1 8.09	7 28 53.23
15	7 38 31.07	32.03	21 31 19.1	17.0	10.111	23.71	5 41.31	15 46.53	1 8.02	7 32 49.78
16	7 42 33.47	34.44	+21 21 38.8	36.5	10.089	−24.62	+ 5 47.15	15 46.59	1 7.95	7 36 46.34
17	7 46 35.34	36.33	21 11 36.7	34.3	10.067	25.52	5 52.47	15 46.65	1 7.88	7 40 42.89
18	7 50 36.69	37.69	21 1 13.1	10.6	10.045	26.42	5 57.26	15 46.72	1 7.81	7 44 39.45
19	7 54 37.49	38.50	20 50 28.1	25.4	10.022	27.31	6 1.50	15 46.79	1 7.73	7 48 36.00
20	7 58 37.75	38.76	20 39 22.0	19.2	9 999	28.18	6 5.20	15 46.87	1 7.65	7 52 32.56
21	8 2 37.45	38.47	+20 27 55.0	52.1	9.976	−29.05	+ 6 8.36	15 46.95	1 7.57	7 56 29.11
22	8 6 36.60	37.63	20 16 7.4	4.4	9.953	29.90	6 10.95	15 47.02	1 7.49	8 0 25.67
23	8 10 35.19	36.22	20 3 59.4	56.3	9.929	30.75	6 12.97	15 47.10	1 7.41	8 4 22.23
24	8 14 33.21	34.24	19 51 31.2	28.0	9.906	31.59	6 14.43	15 47.19	1 7.33	8 8 18.79
25	8 18 30.67	31.70	19 38 43.1	39.8	9.882	32.42	6 15.33	15 47.28	1 7.24	8 12 15.34
26	8 22 27.55	28.59	+19 25 35.3	31.9	9.859	−33.23	+ 6 15.66	15 47.37	1 7.16	8 16 11.90
27	8 26 23.87	24.90	19 12 8.1	4.6	9.835	34.03	6 15.42	15 47.47	1 7.07	8 20 8.45
28	8 30 19.60	20.63	18 58 21.8	18.2	9.811	34.82	6 14.59	15 47.57	1 6.99	8 24 5.01
29	8 34 14.74	15.76	18 44 16.6	12.9	9.786	35.60	6 13.18	15 47.68	1 6.90	8 28 1.56
30	8 38 9.30	10.31	18 29 52.9	49.1	9.762	36.36	6 11.18	15 47.79	1 6.81	8 31 58.12
31	8 42 3.27	4.27	+18 15 11.0	7.2	9.737	−37.12	+ 6 8.59	15 47.91	1 6.72	8 35 54.67
Aug. 1	8 45 56.65	57.64	18 0 11.1	7.3	9.712	37.86	6 5.41	15 48.03	1 6.64	8 39 51.23
2	8 49 49.42	50.40	17 44 53.6	49.7	9.687	38.59	6 1.63	15 48.16	1 6.55	8 43 47.78
3	8 53 41.60	42.56	17 29 18.7	14.8	9.662	39.30	5 57.25	15 48.29	1 6.46	8 47 44.34
4	8 57 33.17	34.11	17 13 26.7	22.8	9.636	40.01	5 52.26	15 48.42	1 6.37	8 51 40.89
5	9 1 24.14	25.06	+16 57 17.9	14.0	9.611	−40.70	+ 5 46.67	15 48.56	1 6.28	8 55 37.45
6	9 5 14.50	15.40	16 40 52.9	49.0	9.586	41.38	5 40.48	15 48.71	1 6.20	8 59 34.00
7	9 9 4.26	5.14	16 24 11.8	7.9	9.561	42.05	5 33.68	15 48.86	1 6.11	9 3 30.56
8	9 12 53.42	54.28	16 7 14.6	10.7	9.536	42.70	5 26.28	15 49.02	1 6.03	9 7 27.11
9	9 16 41.98	42.82	15 49 62.0	58.1	9.511	43.33	5 18.28	15 49.18	1 5.94	9 11 23.67
10	9 20 29.94	30.76	+15 32 34.4	30.6	9.486	−43.96	+ 5 9.69	15 49.35	1 5.86	9 15 20.22
11	9 24 17.32	18.11	15 14 51.8	48.0	9.462	44.58	5 0.52	15 49.52	1 5.78	9 19 16.78
12	9 28 4.12	4.88	14 56 54.7	51.0	9.438	45.18	4 50.76	15 49.69	1 5.70	9 23 13.33
13	9 31 50.34	51.07	14 38 43.2	39.6	9.414	45.77	4 40.42	15 49.87	1 5.62	9 27 9.89
14	9 35 35.99	36.69	14 20 17.9	14.4	9.391	46.34	4 29.52	15 50.05	1 5.54	9 31 6.44
15	9 39 21.09	21.76	+14 1 38.8	35.4	9.368	−46.90	+ 4 18.06	15 50.23	1 5.46	9 35 3.00
16	9 43 5.65	6.29	+13 42 46.5	43.2	9.346	−47.45	+ 4 6.07	15 50.41	1 5.39	9 38 59.55

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug. 16	9 43 5.65	6.29	+13 42 46.5	43.2	9.346	−47.45	+ 4 6.07	15 50.41	1 5.39	9 38 59.55
17	9 46 49.69	50.29	13 23 41.0	37.8	9.324	47.99	3 53.55	15 50.59	1 5.31	9 42 56.11
18	9 50 33.21	33.78	13 4 22.7	19.6	9.303	48.52	3 40.53	15 50.78	1 5.24	9 46 52.66
19	9 54 16.24	16.78	12 44 51.9	49.0	9.283	49.04	3 27.04	15 50.97	1 5.16	9 50 49.21
20	9 57 58.80	59.30	12 25 9.0	6.3	9.263	49.54	3 13.01	15 51.16	1 5.09	9 54 45.76
21	10 1 40.89	41.35	+12 5 14.2	11.7	9.244	−50.03	+ 2 58.54	15 51.35	1 5.02	9 58 42.32
22	10 5 22.53	22.95	11 45 7.8	5.5	9.226	50.50	2 43.63	15 51.55	1 4.96	10 2 38.87
23	10 9 3.74	4.12	11 24 50.1	48.0	9.208	50.96	2 28.28	15 51.75	1 4.89	10 6 35.42
24	10 12 44.52	44.87	11 4 21.6	19.7	9.191	51.41	2 12.53	15 51.95	1 4.83	10 10 31.97
25	10 16 24.91	25.21	10 43 42.3	40.6	9.175	51.85	1 56.36	15 52.15	1 4.77	10 14 28.53
26	10 20 4.90	5.15	+10 22 52.8	51.3	9.159	−52.27	+ 1 39.83	15 52.36	1 4.71	10 18 25.08
27	10 23 44.53	44.73	10 1 53.3	52.0	9.144	52.68	1 22.88	15 52.57	1 4.65	10 22 21.63
28	10 27 23.79	23.95	9 40 44.1	43.1	9.129	53.07	1 5.60	15 52.78	1 4.60	10 26 18.18
29	10 31 2.71	2.83	9 19 25.7	24.9	9.115	53.45	0 47.97	15 53 00	1 4.55	10 30 14.74
30	10 34 41.30	41.37	8 57 58.2	57.7	9.101	53.81	0 30.01	15 53.22	1 4.50	10 34 11.29
31	10 38 19.57	19.59	+ 8 36 22.1	21.9	9.088	−54.16	+ 0 11.73	15 53.44	1 4.45	10 38 7.84
Sept. 1	10 41 57.53	57.51	8 14 37.7	37.8	9.075	54.50	− 0 6.86	15 53.67	1 4.40	10 42 4.39
2	10 45 35.20	35.14	7 52 45.3	45.7	9.063	54.83	0 25.74	15 53.90	1 4.36	10 46 0.95
3	10 49 12.59	12.48	7 30 45.3	46.0	9.052	55.15	0 44.90	15 54.14	1 4.32	10 49 57.50
4	10 52 49.71	49.55	7 8 38.0	39.0	9.041	55.45	1 4.33	15 54.38	1 4.28	10 53 54.05
5	10 56 26.58	26.37	+ 6 46 23.8	25.1	9.031	−55.73	− 1 24.01	15 54.62	1 4.25	10 57 50.60
6	11 0 3.22	2.96	6 24 3.0	4.6	9.022	56.00	1 43.92	15 54.87	1 4.22	11 1 47.16
7	11 3 39.63	39.32	6 1 35.9	37.8	9.013	56.25	2 4.05	15 55.12	1 4.19	11 5 43.71
8	11 7 15.84	15.48	5 39 2.9	5.1	9.005	56.49	2 24.39	15 55.37	1 4.16	11 9 40.26
9	11 10 51.86	51.45	5 16 24.4	27.0	8.997	56.71	2 44.92	15 55.62	1 4.14	11 13 36.81
10	11 14 27.71	27.25	+ 4 53 40.6	43.5	8.991	−56.92	− 3 5.62	15 55.87	1 4.12	11 17 33.37
11	11 18 3.42	2.91	4 30 51.7	54.9	8.985	57.11	3 26.45	15 56.13	1 4 10	11 21 29.92
12	11 21 39.00	38.44	4 7 58.2	61.8	8.980	57.30	3 47.42	15 56.39	1 4.08	11 25 26.47
13	11 25 14.46	13.84	3 45 0.4	4.4	8 976	57.47	4 8.50	15 56.65	1 4.07	11 29 23.02
14	11 28 49.83	49.16	3 21 58.6	62.9	8.973	57.63	4 29.68	15 56.91	1 4.06	11 33 19.57
15	11 32 25.15	24.43	+ 2 58 53.1	57.7	8.971	−57.78	− 4 50.90	15 57.17	1 4.05	11 37 16.12
16	11 35 60.44	59.66	2 35 44.3	49.3	8.970	57.92	5 12.17	15 57.43	1 4.05	11 41 12.68
17	11 39 35.70	34.87	2 12 32.4	37.8	8.970	58.04	5 33.45	15 57.70	1 4.05	11 45 9.23
18	11 43 10.98	10.10	1 49 17.8	23.5	8.971	58.15	5 54.72	15 57.96	1 4.05	11 49 5.78
19	11 46 46.28	45.35	1 26 0.7	6.7	8.973	58.25	6 15.96	15 58.22	1 4.06	11 53 2.33
20	11 50 21.65	20.65	+ 1 2 41.5	47.9	8.976	−58.33	− 6 37.15	15 58.48	1 4.07	11 56 58.89
21	11 53 57.08	56.04	0 39 20.6	27.4	8.979	58.40	6 58.26	15.58.75	1 4.08	12 0 55.44
22	11 57 32 63	31.54	+ 0 15 58.2	65.3	8.984	58.45	7 19.26	15 59.01	1 4.09	12 4 51.99
23	12 1 8.30	7.16	− 0 7 25.4	18.0	8.989	58.49	7 40.13	15 59.28	1 4.11	12 8 48.54
24	12 4 44.12	42.92	0 30 49.7	41.9	8.996	58.51	8 0.87	15 59.54	1 4.13	12 12 45.10
25	12 8 20.10	18.84	− 0 54 14.4	6.2	9.003	−58.52	− 8 21.43	15 59.81	1 4.15	12 16 41.65
26	12 11 56.27	54.96	1 17 39.2	30.7	9.011	58.52	8 41.81	16 0.08	1 4.18	12 20 38.20
27	12 15 32.64	31.28	1 40 63.7	54.9	9.020	58.50	9 1.99	16 0.35	1 4.21	12 24 34.75
28	12 19 9.24	7.83	2 4 27.6	18.5	9.030	58.47	9 21.95	16 0.62	1 4.24	12 28 31.31
29	12 22 46.08	44.62	2 27 50.4	41.0	9.040	58.42	9 41.65	16 0.89	1 4.28	12 32 27.86
30	12 26 23.18	21.67	− 2 51 11.9	2.2	9.051	−58.36	−10 1.10	16 1.16	1 4.32	12 36 24.41
31	12 29 60.56	59.00	− 3 14 31.5	21.5	9.063	−58.28	−10 20.27	16 1.44	1 4.36	12 40 20.96

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 29 60.56	59.00	− 3 14 31.5	21.5	9.063	−58.28	−10 20.27	16 1.44	1 4.36	12 40 20.96
2	12 33 38.22	36.62	3 37 49.1	38.8	9.076	58.18	10 39.15	16 1.71	1 4.40	12 44 17.51
3	12 37 16.21	14.55	4 0 64.2	53.6	9.089	58.07	10 57.72	16 1.99	1 4.45	12 48 14.06
4	12 40 54.51	52.80	4 24 16.4	5.5	9.103	57.94	11 15.97	16 2.28	1 4.50	12 52 10.62
5	12 44 33.15	31.39	4 47 25.4	14.2	9.118	57.80	11 33.88	16 2.56	1 4.56	12 56 7.17
6	12 48 12.15	10.34	− 5 10 30.8	19.3	9.134	−57.64	−11 51.43	16 2.84	1 4.62	13 0 3.72
7	12 51 51.53	49.67	5 33 32.1	20.4	9.150	57.46	12 8.60	16 3.12	1 4.68	13 4 0.27
8	12 55 31.30	29.40	5 56 29.2	17.3	9.167	57.27	12 25.38	16 3.41	1 4.74	13 7 56.82
9	12 59 11.49	9.55	6 19 21.5	9.4	9.184	57.07	12 41.75	16 3.69	1 4.80	13 11 53.38
10	13 2 52.11	50.12	6 41 68.7	56.4	9.202	56.85	12 57.68	16 3.97	1 4.87	13 15 49.93
11	13 6 33.18	31.15	− 7 4 50.5	38.0	9.221	−56.62	−13 13.16	16 4.25	1 4.94	13 19 46.48
12	13 10 14.73	12.65	7 27 26.4	13.7	9.241	56.37	13 28.16	16 4.53	1 5.01	13 23 43.03
13	13 13 56.76	54.64	7 49 56.1	43.3	9.262	56.10	13 42.68	16 4.81	1 5.09	13 27 39.58
14	13 17 39.31	37.15	8 12 19.3	6.4	9.284	55.82	13 56.69	16 5.09	1 5.17	13 31 36.14
15	13 21 22.41	20.21	8 34 35.6	22.6	9.307	55.52	14 10.15	16 5.36	1 5.25	13 35 32.69
16	13 25 6.06	3.82	− 8 56 44.6	31.5	9.331	−55.21	−14 23.05	16 5.63	1 5.33	13 39 29.24
17	13 28 50.29	48.01	9 18 45.9	32.7	9.356	54.88	14 35.38	16 5.90	1 5.42	13 43 25.79
18	13 32 35.12	32.80	9 40 39.3	26.0	9.382	54.54	14 47.10	16 6.17	1 5.51	13 47 22.34
19	13 36 20.58	18.23	10 2 24.2	10.8	9.408	54.19	14 58.20	16 6.44	1 5.60	13 51 18.90
20	13 40 6.68	4.30	10 23 60.4	46.9	9.435	53.81	15 8.66	16 6.71	1 5.69	13 55 15.45
21	13 43 53.44	51.03	−10 45 27.4	13.8	9.463	−53.42	−15 18.46	16 6.97	1 5.79	13 59 12.00
22	13 47 40.88	38.44	11 6 44.9	31.2	9.492	53.02	15 27.59	16 7.23	1 5.89	14 3 8.56
23	13 51 29.02	26.55	11 27 52.4	38.7	9.521	52.60	15 36.01	16 7.49	1 5.99	14 7 5.11
24	13 55 17.87	15.38	11 48 49.7	35.9	9.551	52.16	15 43.72	16 7.75	1 6.09	14 11 1.67
25	13 59 7.45	4.92	12 9 36.1	22.4	9.581	51.70	15 50.70	16 8.01	1 6.19	14 14 58.22
26	14 2 57.77	55.21	−12 29 71.5	57.8	9.612	−51.23	−15 56.94	16 8.27	1 6.29	14 18 54.77
27	14 6 48.83	46.25	12 50 35.3	21.7	9.643	50.74	16 2.44	16 8.52	1 6.40	14 22 51.32
28	14 10 40.65	38.05	13 10 47.2	33.7	9.675	50.23	16 7.18	16 8.78	1 6.51	14 26 47.88
29	14 14 33.25	30.63	13 30 46.6	33.2	9.708	49.71	16 11.15	16 9.03	1 6.62	14 30 44.43
30	14 18 26.62	23.98	13 50 33.3	20.0	9.741	49.17	16 14.34	16 9.29	1 6.73	14 34 40.99
31	14 22 20.77	18.12	−14 9 66.7	53.5	9.773	−48.61	−16 16.75	16 9.54	1 6.84	14 38 37.54
Nov. 1	14 26 15.71	13.05	14 29 26.5	13.4	9.806	48.03	16 18.37	16 9.79	1 6.95	14 42 34.09
2	14 30 11.44	8.77	14 48 32.2	19.3	9.839	47.44	16 19.20	16 10.04	1 7.07	14 46 30 64
3	14 34 7.97	5.29	15 7 23.4	10.7	9.872	46.82	16 19.24	16 10.29	1 7.19	14 50 27.20
4	14 38 5.31	2.62	15 25 59.8	47.2	9.906	46.19	16 18.46	16 10.54	1 7.31	14 54 23.75
5	14 42 3.46	0.76	−15 44 20.8	8.5	9.940	−45.54	−16 16.88	16 10.79	1 7.43	14 58 20.31
6	14 45 62.42	59.72	16 2 26.2	14.1	9.974	44.88	16 14.48	16 11.03	1 7.54	15 2 16.86
7	14 49 62.19	59.49	16 20 15.4	3.5	10.008	44.20	16 11.27	16 11.27	1 7.66	15 6 13.42
8	14 54 2.79	0.09	16 37 48.1	36.4	10.042	43.51	16 7.24	16 11.51	1 7.78	15 10 9.97
9	14 58 4.21	1.51	16 54 63.9	52.4	10.076	42.80	16 2.38	16 11.74	1 7.90	15 14 6.53
10	15 2 6.45	3.76	−17 11 62.3	51.1	10.111	−42.07	−15 56.70	16 11.97	1 8.02	15 18 3.08
11	15 6 9.53	6.85	17 28 43.1	32.1	10.146	41.32	15 50.19	16 12.20	1 8.14	15 21 59.64
12	15 10 13.45	10.78	17 44 65.6	55.0	10.181	40.55	15 42.83	16 12.42	1 8.26	15 25 56.19
13	15 14 18.21	15.55	18 0 69.7	59.4	10.216	39.77	15 34.63	16 12.64	1 8.38	15 29 52.75
14	15 18 23.81	21.17	18 16 54.9	44.9	10.251	38.98	15 25.59	16 12.86	1 8.50	15 33 49.30
15	15 22 30.25	27.63	−18 32 20.8	11.1	10.286	−38.17	−15 15.72	16 13.07	1 8.62	15 37 45.86
16	15 26 37.54	34.94	−18 47 27.1	17.7	10.321	−37.35	−15 5.00	16 13.28	1 8.74	15 41 42.42

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0^{s}.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 16	15 26 37.54	34.94	−18 47 27.1	17.7	10.321	−37.35	−15 5.00	16 13.28	1 8.74	15 41 42.42
17	15 30 45.68	43.11	19 2 13.4	4.3	10.356	36.51	14 53.42	16 13.48	1 8.86	15 45 38.98
18	15 34 54.66	52.12	19 16 39.2	30.5	10.392	35.65	14 41.00	16 13.68	1 8.97	15 49 35.53
19	15 39 4.48	1.97	19 30 44.3	35.9	10.427	34 77	14 27.75	16 13.88	1 9.09	15 53 32.09
20	15 43 15.14	12.66	19 44 28.2	20.2	10.462	33.88	14 13.65	16 14.07	1 9.20	15 57 28.64
21	15 47 26.63	24.19	−19 57 50.6	42.9	10.496	−32.98	−13 58.72	16 14.25	1 9.31	16 1 25.20
22	15 51 38.95	36.55	20 10 51.2	43.8	10.530	32.06	13 42.96	16 14.13	1 9.42	16 5 21.75
23	15 55 52.08	49.72	20 23 29.6	22.6	10.563	31.12	13 26.39	16 14.61	1 9.53	16 9 18.31
24	16 0 5.99	3.67	20 35 45.3	38.7	10.595	30.17	13 9.03	16 14.79	1 9.63	16 13 14.86
25	16 4 20.69	18.42	20 47 38.1	31.8	10.628	29.21	12 50.89	16 14.97	1 9.73	16 17 11.42
26	16 8 36.16	33.94	−20 59 7.7	1.7	10.660	−28.23	−12 31.97	16 15.14	1 9.83	16 21 7.97
27	16 12 52.38	50.21	21 10 13.7	8.1	10.691	27.24	12 12.31	16 15.31	1 9.93	16 25 4.53
28	16 17 9.32	7.21	21 20 55.7	50.5	10.721	26.24	11 51.93	16 15.47	1 10.03	16 29 1.08
29	16 21 26.97	24.91	21 31 13.5	8.6	10.750	25.22	11 30.84	16 15.63	1 10.12	16 32 57.64
30	16 25 45.30	43.30	21 41 6.7	2.1	10.778	24.19	11 9.07	16 15.79	1 10.21	16 36 54.20
Dec. 1	16 30 4.29	2.35	−21 50 35.1	30.9	10.805	−23.15	−10 46.64	16 15.94	1 10.30	16 40 50.76
2	16 34 23.90	22.02	21 59 38.3	34.5	10.831	22.10	10 23.58	16 16.09	1 10.39	16 44 47.31
3	16 38 44.11	42.30	22 8 16.1	12.6	10.855	21.03	9 59.92	16 16.24	1 10.47	16 48 43.87
4	16 43 4.92	3.18	22 16 28.2	25.0	10.879	19.96	9 35.66	16 16.38	1 10.55	16 52 40.42
5	16 47 26.28	24.61	22 24 14.3	11.4	10.901	18.87	9 10.86	16 16.52	1 10.63	16 56 36.98
6	16 51 48.15	46.55	−22 31 34.3	31.7	10.922	−17.78	− 8 45.54	16 16.66	1 10.70	17 0 33.54
7	16 56 10.52	9.00	22 38 27.9	25.6	10.942	16.67	8 19.72	16 16.79	1 10.77	17 4 30.10
8	17 0 33.37	31.93	22 44 54.8	52.8	10.961	15.56	7 53.42	16 16.92	1 10.84	17 8 26.65
9	17 4 56.66	55.30	22 50 54.8	53.1	10.979	14.44	7 26.69	16 17.04	1 10.90	17 12 23.21
10	17 9 20.36	19.08	22 56 27.8	26.3	10.996	13.31	6 59.53	16 17.16	1 10.96	17 16 19.76
11	17 13 44.45	43.25	−23 1 33.6	32.3	11.012	−12.17	− 6 31.99	16 17.27	1 11.01	17 20 16.32
12	17 18 8.92	7.80	23 6 12.0	10.9	11.027	11.03	6 4.08	16 17.38	1 11.06	17 24 12.88
13	17 22 33.72	32.69	23 10 22.9	21.9	11.040	9.88	5 35.83	16 17.48	1 11.11	17 28 9.44
14	17 26 58.82	57.88	23 14 6.1	5.4	11.052	8.72	5 7.27	16 17.58	1 11.15	17 32 5.99
15	17 31 24.20	23.35	23 17 21.5	21.0	11.063	7.56	4 38.44	16 17.66	1 11.18	17 36 2.55
16	17 35 49.85	49.08	−23 20 9.0	8.6	11.073	− 6.39	− 4 9.34	16 17.74	1 11.21	17 39 59.11
17	17 40 15.72	15.04	23 22 28.4	28.1	11.081	5.22	3 40.02	16 17.82	1 11.24	17 43 55.67
18	17 44 41.78	41.19	23 24 19.7	19.5	11.089	4.05	3 10.50	16 17.89	1 11.26	17 47 52.22
19	17 49 8.01	7.51	23 25 42.9	42.8	11.095	2.88	2 40.82	16 17.95	1 11.28	17 51 48.78
20	17 53 34.37	33.97	23 26 37.9	37.9	11.100	1.70	2 11.01	16 18.01	1 11.29	17 55 45.34
21	17 58 0.83	0.52	−23 27 4.6	4.6	11.104	− 0.52	− 1 41.10	16 18.07	1 11.30	17 59 41.90
22	18 2 27.36	27.14	23 27 2.9	3.0	11.106	+ 0.66	1 11.11	16 18.12	1 11.30	18 3 38.45
23	18 6 53.92	53.79	23 26 32.9	33.0	11.107	1.84	0 41.10	16 18.16	1 11.30	18 7 35.01
24	18 11 20.48	20.44	23 25 34.7	34.8	11.106	3.02	− 0 11.08	16 18.20	1 11.29	18 11 31.56
25	18 15 47.00	47.05	23 24 8.2	8.2	11.104	4.20	+ 0 18.89	16 18.23	1 11.28	18 15 28.12
26	18 20 13.43	13.58	−23 22 13.4	13.3	11.100	+ 5.37	+ 0 48.77	16 18.26	1 11.27	18 19 24.68
27	18 24 39.76	40.00	23 19 50.5	50.3	11.094	6.54	1 18.55	16 18.29	1 11.25	18 23 21.24
28	18 29 5.93	6.26	23 16 59.5	59.2	11.087	7.71	1 48.18	16 18.31	1 11.22	18 27 17.79
29	18 33 31.91	32.33	23 13 40.5	40.1	11.078	8.88	2 17.61	16 18.33	1 11.19	18 31 14.35
30	18 37 57.66	58.17	23 9 53.5	53.0	11.068	10.04	2 46.81	16 18.35	1 11.16	18 35 10.91
31	18 42 23.14	23.74	−23 5 38.7	38.1	11.056	+11.19	+ 3 15.74	16 18.36	1 11.12	18 39 7.47
32	18 46 48.32	49.01	−23 0 56.3	55.6	11.043	+12.34	+ 3 44.37	16 18.37	1 11.08	18 43 4.02

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.19 from the sidereal interval.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 0	17 48.19	1.761	12 31 11.37	115.82	− 6 54 46.2	−603.4	61.57	14 48.6	54 14.6	II. S.
1	18 31.07	1.818	13 18 8.29	119.26	−10 46 50.0	−553.2	62.50	14 51.8	54 26.2	II. S.
2	19 15.70	1.905	14 6 49.92	124.48	−14 14 10.9	−479.2	63.87	14 57.8	54 48.2	II. S.
3	20 2.69	2.014	14 57 53.78	130.96	−17 6 36.3	−378.0	65.51	15 6.5	55 20.2	II. S.
4	20 52.41	2.129	15 51 41.31	137.95	−19 12 27.4	−246.2	67.21	15 17.3	55 59.9	II. S.
5	21 44.79	2.232	16 48 9.48	144.16	−20 19 35.7	− 84.9	68.70	15 29.4	56 44.4	II. S
6	22 39.30	2.302	17 46 45.53	148.41	−20 17 27.5	+ 98.2	69.68	15 41.9	57 30.1	II. S.
7	23 34.97	2.328	18 46 31.56	149.94	−19 0 2.0	288.4	70.02	15 53.7	58 13.4	II. S.
9	0 30.70	2.309	19 46 21.17	148.78	−16 28 19.5	466.2	69.73	16 3.7	58 50.2	I. S.
10	1 25.60	2.263	20 45 20.89	145.98	−12 51 7.6	613.2	69.08	16 11.1	59 17.6	I. S.
11	2 19.26	2.210	21 43 5.43	142.76	− 8 23 33.7	+716.1	68.33	16 15.7	59 34.2	I. S.
12	3 11.74	2.169	22 39 39.73	140.30	− 3 24 29.6	770.3	67.78	16 17.1	59 39.4	I. S.
13	4 3.52	2.151	23 35 31.54	139.31	+ 1 45 58.0	773.8	67.59	16 15.8	59 35.0	I. S.
14	4 55.25	2.164	0 31 20.36	140.04	6 48 8.3	729.6	67.82	16 12.5	59 22.7	I. S.
15	5 47.59	2.201	1 27 45.55	142.96	11 23 33.0	640.7	68.39	16 7.6	59 4.7	I. S.
16	6 40.99	2.250	2 25 15.17	145.23	+15 15 22.8	+513.0	69.12	16 1.7	58 43.1	I. S.
17	7 35.57	2.296	3 23 55.59	147.92	18 9 6.6	351.6	69.75	15 55.1	58 18.8	I. S.
18	8 30.97	2.315	4 23 24.95	149.15	19 53 48.2	+169.3	69.98	15 48.0	57 52.5	I. S.
19	9 26.38	2.295	5 22 55.35	147.94	20 23 45.2	− 19.4	69.61	15 40.3	57 24.5	I. S.
20	10 20.80	2.233	6 21 25.91	144.20	19 39 42.5	−198.2	68.63	15 32.3	56 55.1	I. N. S.
21	11 13.31	2.139	7 18 1.78	138.54	+17 48 40.6	−359.3	67.18	15 24.1	56 24.9	I. N. S.
22	12 3.36	2.031	8 12 9.70	132.07	15 2 12.8	−474.3	65.51	15 15.7	55 54.0	I. II. S.
23	12 50.84	1.928	9 3 43.07	125.83	11 34 1.1	−561.1	63.89	15 7.6	55 24.4	II. S.
24	13 36.03	1.841	9 52 58.01	120.55	7 37 48.9	−614.7	62.56	15 0.2	54 57.1	II. S.
25	14 19.43	1.781	10 40 26.14	116.99	+ 3 26 6.7	−630.4	61.63	14 54.0	54 34.4	II. S.
26	15 1.74	1.750	11 26 47.83	115.13	− 0 50 14.3	−638.5	61.17	14 49.5	54 17.9	II. S.
27	15 43.67	1.750	12 12 47.34	115.14	− 5 1 48.6	−615.3	61.25	14 47.2	54 9.5	II. S.
28	16 26.00	1.781	12 59 10.03	117.04	− 9 0 3.7	−572.0	61.82	14 47.5	54 10.5	II. S.
29	17 9.42	1.843	13 46 39.84	120.72	−12 36 39.7	−507.2	62.86	14 50.7	54 22.0	II. S.
30	17 54.64	1.929	14 35 56.60	125.90	−15 42 47.0	−419.3	64.25	14 56.8	54 44.5	II. S.
31	18 42.15	2.032	15 27 31.22	132.09	−18 8 40.3	−305.7	65.86	15 5.8	55 17.7	II. S.
Feb. 1	19 32.21	2.139	16 21 39.46	138.54	−19 43 40.5	−164.8	67.46	15 17.5	56 0.7	II. S.
2	20 24.72	2.233	17 18 15.50	144.24	−20 17 8.5	+ 1.3	68.80	15 31.3	56 51.2	II. S.
3	21 19.18	2.299	18 16 49.03	148.17	−19 40 17.3	184.8	69.72	15 46.1	57 45.8	II. N. S.
4	22 14.79	2.328	19 16 30.96	149.90	−17 48 45.6	371.6	70.09	16 0.9	58 40.1	II. N. S.
5	23 10.64	2.321	20 16 27.46	149.52	−14 44 56.5	+543.1	69.94	16 14.1	59 28.6	II. N. S.
7	0 6.03	2.293	21 15 57.25	147.84	−10 38 53.3	680.0	69.50	16 24.4	60 6.2	I. II. S.
8	1 0.70	2.263	22 14 42.31	145.96	− 5 47 27.6	768.1	69.05	16 30.5	60 28.8	I. S.
9	1 54.71	2.242	23 12 48.54	144.72	− 0 32 2.7	799.2	68.79	16 32.0	60 34.3	I. S.
10	2 48.45	2.240	0 10 38.20	144.69	+ 4 44 11.3	772.4	68.82	16 29.1	60 23.6	I. S.
11	3 42.37	2.257	1 8 38.83	145.64	+ 9 38 48.7	+692.2	69.13	16 22.6	59 59.4	I. S.
12	4 36.83	2.282	2 7 11.60	147.17	13 52 0.1	567.0	69.56	16 13.4	59 25.8	I. S.
13	5 31.89	2.305	3 6 21.52	148.53	17 7 50.1	407.7	69.91	16 2.7	58 46.7	I. S.
14	6 27.30	2.308	4 5 51.60	148.72	19 15 19.5	227.7	69.96	15 51.6	58 6.0	I. S.
15	7 22.43	2.280	5 5 4.76	147.05	+20 9 9.8	+ 41.6	69.52	15 40.8	57 26.1	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 15	7 22.43	2.280	5 5 4.76	147.05	+20 9 9.8	+ 41.6	69.52	15 40.8	57 26.1	I. S.
16	8 16.48	2.219	6 3 13.62	143.34	19 49 57.0	−135.4	68.56	15 30.6	56 48.8	I. n.S.
17	9 8.75	2.133	6 59 34.95	138.19	18 23 36.3	−292.3	67.19	15 21.3	56 14.7	I. N.s.
18	9 58.78	2.036	7 53 41.53	132.25	15 59 55.2	−421.3	65.62	15 13.0	55 44.0	I. N.
19	10 46.47	1.940	8 45 26.93	126.56	12 50 47.8	−519.7	64.07	15 5.6	55 16.8	I. N.s.
20	11 32.01	1.858	9 35 3.23	121.63	+ 9 8 43.0	−586.1	62.74	14 59.1	54 53.1	I. n.S.
21	12 15.82	1.797	10 22 56.04	117.99	5 5 44.7	−623.9	61.75	14 53.6	54 32.9	I. II. S.
22	12 58.48	1.762	11 9 38.88	115.84	+ 0 53 2.3	−635.3	61.18	14 49.3	54 17.1	II. S.
23	13 40.59	1.753	11 55 49.10	115.28	− 3 19 12.7	−622.1	61.06	14 46.4	54 6.5	II. S.
24	14 22.80	1.770	12 42 4.99	116.31	− 7 21 37.6	−586.3	61.40	14 45.2	54 2.0	II. S.
25	15 5.72	1.811	13 29 3.85	118.85	−11 5 19.3	−528.7	62.15	14 46.0	54 5.0	II. S.
26	15 49.92	1.875	14 17 19.73	122.69	−14 21 33.1	−448.8	63.24	14 49.2	54 16.6	II. S.
27	16 35.87	1.956	15 7 20.63	127.52	−17 1 23.8	−346.4	64.59	14 55.0	54 37.8	II. S.
28	17 23.86	2.045	15 59 24.74	132.87	−18 55 41.1	−221.2	66.01	15 3.5	55 9.1	II. S.
Mar. 1	18 13.98	2.130	16 53 36.44	138.03	−19 55 18.3	− 73.7	67.33	15 14.8	55 50.6	II. S.
2	19 6.01	2.202	17 49 43.63	142.37	−19 52 4.3	+ 92.1	68.39	15 28.4	56 40.8	II. n.S.
3	19 59.52	2.252	18 47 19.49	145.37	−18 40 8.9	268.1	69.09	15 44.0	57 38.0	II. N.s.
4	20 53.93	2.278	19 45 49.44	146.90	−16 17 48.2	441.8	69.40	16 0.3	58 37.9	II. N.
5	21 48.71	2.285	20 44 41.90	147.31	−12 48 55.7	598.0	69.45	16 16.0	59 35.4	II. N.
6	22 43.55	2.285	21 43 37.83	147.32	− 8 23 56.1	719.8	69.38	16 29.3	60 24.3	II. N.s.
7	23 38.41	2.289	22 42 35.31	147.56	− 3 19 38.4	+792.4	69.40	16 38.6	60 58.6	II. n.S.
9	0 33.51	2.305	23 41 46.67	148.52	+ 2 1 56.6	805.3	69.65	16 42.7	61 13.7	I. S.
10	1 29.14	2.333	0 41 30.29	150.21	7 15 54.3	754.4	70.09	16 41.2	61 8.0	I. S.
11	2 25.53	2.366	1 41 59.37	152 19	11 57 26.7	644.3	70.61	16 34.3	60 42.7	I. S.
12	3 22.62	2.388	2 43 10.72	153.58	15 45 5.2	487.3	71.01	16 23.3	60 2.4	I. S.
13	4 19.98	2.385	3 44 38.26	153.39	+18 23 25.6	+301.1	71.03	16 9.8	59 12.7	I. S.
14	5 16.84	2.345	4 45 35.60	151.00	19 44 48.3	+105.9	70.49	15 55.3	58 19.3	I. S.
15	6 12.28	2.270	5 45 8.47	146.41	19 49 22.6	− 80.1	69.37	15 41.0	57 26.8	I. n.S.
16	7 5.58	2.168	6 42 31.09	140.31	18 43 39.6	−244.0	67.83	15 27.8	56 38.4	I. N.
17	7 56.28	2.057	7 37 18.18	133.62	16 38 8.0	−378.5	66.10	15 16.3	55 56.2	I. N.
18	8 44.37	1.952	8 29 27.97	127.31	+13 44 55.7	−482.3	64.40	15 6.7	55 20.8	I. N.
19	9 30.13	1.865	9 19 17.76	122.05	10 16 11.9	−556.5	62.94	14 58.9	54 52.3	I. N.
20	10 14.06	1.801	10 7 17.28	118.17	6 23 23.3	−603.2	61.84	14 52.9	54 30.1	I. N.
21	10 56.76	1.762	10 54 2.50	115.86	+ 2 17 3.7	−624.2	61.16	14 48.5	54 14.1	I. N.s.
22	11 38.85	1.750	11 40 11.50	115.14	− 1 52 53.9	−621.6	60.93	14 45.6	54 3.6	I. N.S.
23	12 20.96	1.763	12 26 21.59	115.94	− 5 57 3.7	−595.4	61.14	14 44.2	53 58.4	II. S.
24	13 3.67	1.799	13 13 7.56	118.10	− 9 46 10.8	−546.3	61.76	14 44.3	53 58.7	II. S.
25	13 47.47	1.854	14 0 59.53	121.39	−13 11 2.9	−474.2	62.68	14 46.0	54 4.9	II. S.
26	14 32.76	1.922	14 50 20.83	125.46	−16 2 27.8	−379.0	63.82	14 49.5	54 17.8	II. S.
27	15 19.73	1.995	15 41 25.06	129.89	−18 11 23.1	−261.8	65.05	14 55.0	54 38.1	II. S.
28	16 8.49	2.064	16 34 13.74	134.08	−19 29 21.4	−124.8	66.20	15 2.7	55 6.5	II. S.
29	16 58.78	2.123	17 28 35.84	137.59	−19 49 9.3	+ 28.1	67.14	15 12.8	55 43.4	II. n.S
30	17 50.27	2.164	18 24 10.07	140.07	−19 5 38.6	190.3	67.79	15 25.2	56 28.8	II. N.
31	18 42.53	2.188	19 20 31.20	141.54	−17 16 42.3	353.5	68.15	15 39.4	57 21.2	II. N.
32	19 35.23	2.202	20 17 18.37	142.33	−14 23 59.7	+507.8	68.31	15 55.0	58 18.3	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 1	19 35.23	2.202	20 17 18.37	142.33	−14 23 59.7	+507.8	68.31	15 55.0	58 18.3	II. N.
2	20 28.21	2.214	21 14 22.19	143.03	−10 33 35.4	639.7	68.42	16 10.8	59 16.2	II. N.
3	21 21.55	2.234	22 11 48.13	144.96	− 5 56 26.0	739.0	68.65	16 25.3	60 9.7	II. N.
4	22 15.57	2.271	23 9 54.78	146.47	− 0 48 39.7	791.1	69.16	16 36.9	60 52.3	II. N.
5	23 10.69	2.325	0 9 7.51	149.73	+ 4 28 38.9	784.9	69.92	16 44.0	61 18.3	II. N. s.
7	0 7.26	2.390	1 9 47.88	153.65	+ 9 30 45.1	+714.7	70.85	16 45.4	61 23.6	I. II. N. S
8	1 5.37	2.449	2 12 0.23	157 21	13 52 3.1	585.3	71.72	16 40.9	61 6.8	I. S.
9	2 4.59	2.479	3 15 19.70	159.01	17 10 11.3	402.0	72.20	16 31.0	60 30.6	I. S.
10	3 3.98	2.460	4 18 49.48	157.92	19 10 16.6	+196.4	72.00	16 17.4	59 40.5	I. S.
11	4 2.28	2.388	5 21 13.63	153.50	19 47 29.7	− 8.2	71.03	16 1.6	58 42.7	I. N. S.
12	4 58.31	2.275	6 21 21.14	146.73	+19 6 38.3	−191.0	69.42	15 45.5	57 43.3	I. N.
13	5 51.33	2.142	7 18 27.36	138.71	17 19 2.4	−340.9	67.44	15 30.2	56 47.1	I. N.
14	6 41.15	2.010	8 12 21.25	130.90	14 38 44.4	−454.7	65.43	15 16.7	55 57.6	I. N.
15	7 28.06	1.899	9 3 20.00	124.93	11 19 36.7	−535.7	63.66	15 5.5	55 16.5	I. N.
16	8 12.63	1.818	9 51 58.32	119.25	7 34 1.3	−587.8	62.28	14 56.8	54 44.5	I. N.
17	8 55.58	1.767	10 38 59.11	116.13	+ 3 32 40.7	−615.0	61.38	14 50.5	54 21.5	I. N.
18	9 37.66	1.745	11 25 7.35	114.86	− 0 34 56.1	−619.4	60.96	14 46.5	54 6.7	I. N.
19	10 19.59	1.753	12 11 6.37	115.33	− 4 39 55.6	−602.0	61.03	14 44.5	53 59.3	I. N.
20	11 2.02	1.787	12 57 35.67	117.34	− 8 33 28.2	−561.9	61.53	14 44.3	53 58.7	I. N.
21	11 45.51	1.841	13 45 8.92	120.61	−12 6 26.6	−498.8	62.39	14 45.7	54 3.9	I. N. S.
22	12 30.49	1.909	14 34 11.24	124.68	−15 9 21.4	−411.6	63.48	14 48.7	54 14.7	II. N. S.
23	13 17.16	1.981	15 24 56.11	129.04	−17 32 36.7	−300.9	64.64	14 53.0	54 30.5	II. S.
24	14 5.53	2.047	16 17 22.59	133.05	−19 7 10.4	−168.9	65.73	14 58.7	54 51.6	II. N. S.
25	14 55.32	2.098	17 11 14.96	136.12	−19 45 28.0	− 20.6	66.58	15 6.0	55 18.3	II. N. S.
26	15 46.09	2.128	18 6 6.14	137.92	−19 22 25.4	+136.4	67.10	15 14.8	55 50.7	II. N.
27	16 37.34	2.138	19 1 25.60	138.52	−17 56 15.8	+293.7	67.31	15 25.3	56 29.2	II. N.
28	17 28.64	2.136	19 56 49.07	138.36	−15 28 49.3	441.5	67.31	15 37.2	57 13.0	II. N.
29	18 19.85	2.133	20 52 6.46	138.14	−12 5 28.4	571.5	67.26	15 50.3	58 1.1	II. N.
30	19 11.09	2.140	21 47 25.55	138.62	− 7 54 55.6	676.0	67.36	16 3.9	58 51.0	II. N.
May 1	20 2.75	2.170	22 43 10.64	140.39	− 3 9 18.4	745.5	67.76	16 17.0	59 39.1	II. N.
2	20 55.44	2.226	23 39 57.24	143.77	+ 1 55 35.7	+770.6	68.54	16 28.3	60 20.6	II. N.
3	21 49.78	2.306	0 38 23.09	148.57	7 0 1.3	741.6	69.67	16 36.3	60 50.2	II. N.
4	22 46.23	2.399	1 38 56.08	154.16	11 40 49.1	652.0	70.98	16 39.9	61 3.3	II. N.
5	23 44.83	2.480	2 41 37.91	159.06	15 33 40.1	503.0	72.12	16 38.2	60 56.9	II. N. s.
7	0 44.94	2.520	3 45 51.12	161.49	18 17 11.7	306.7	72.70	16 31.2	60 31.2	I. N. S.
8	1 45.29	2.497	4 50 18.56	160.11	+19 37 56.0	+ 94.0	72.41	16 19.7	59 48.9	I. N. S.
9	2 44.28	2.408	5 53 24.26	154.81	19 33 34.0	−112.1	71.21	16 5.2	58 55.8	I. N. s.
10	3 40.54	2.275	6 53 46.32	146.76	18 12 13.6	−288.2	69.32	15 49.4	57 57.6	I. N.
11	4 33.38	2.127	7 50 40.98	137.77	15 48 28.4	−423.7	67.15	15 33.7	57 0.2	I. N.
12	5 22.71	1.988	8 44 5.76	129.47	12 38 38.6	−519.3	65.06	15 19.4	56 7.8	I. N.
13	6 9.02	1.877	9 34 28.73	122.76	+ 8 57 43.3	−579.1	63.30	15 7.4	55 23.4	I. N.
14	6 53 05	1.799	10 22 34.19	118.07	4 58 14.6	−613.0	62.03	14 57.9	54 48.4	I. N.
15	7 35.64	1.756	11 9 12.74	115.50	+ 0 50 30.9	−622.1	61.30	14 51.1	54 23.7	I. N.
16	8 17.61	1.748	11 55 14.99	115.02	− 3 16 38.3	−610.2	61.10	14 47.2	54 9.3	I. N.
17	8 59.78	1.771	12 41 28.41	116.40	− 7 14 57.1	−577.8	61.41	14 45.7	54 3.9	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 17	8 59.78	1.771	12 41 28.41	116.40	− 7 14 57.1	−577.8	61.41	14 45.7	54 3.9	I. N.
18	9 42.83	1.820	13 28 35.00	119.38	−10 56 0.9	−523 7	62.17	14 46.5	54 6.9	I. N.
19	10 27.31	1.890	14 17 8.49	123.57	−14 10 46.9	−446.1	63.23	14 49.3	54 17.2	I. N.
20	11 13.62	1.969	15 7 30.61	128.32	−16 49 34.9	−343.8	64.44	14 53.7	54 33.3	I. N.
21	12 1.82	2.046	15 59 46.93	132.94	−18 42 36.9	−217.6	65.61	14 59.4	54 54.1	I. II. N. s.
22	12 51.70	2.107	16 53 44.09	136.61	−19 41 0.6	− 71.6	66.56	15 6.1	55 18.7	II. N. s.
23	13 42.74	2.141	17 48 51.50	138.72	−19 38 17.8	+ 86.4	67.14	15 13.6	55 46.4	II. N.
24	14 34.28	2.149	18 44 29.21	139.15	−18 31 42.0	246.0	67.30	15 21.9	56 16.7	II. N.
25	15 25.72	2.134	19 40 0.05	138.25	−16 22 48.5	396.3	67.14	15 30.8	56 49.6	II. N.
26	16 16.65	2.110	20 35 1.36	136.84	−13 17 18.4	527.6	66.84	15 40.3	57 24.4	II. N.
27	17 7.07	2.093	21 29 31.25	135.79	− 9 24 13.5	+632.9	66.62	15 50.3	58 1.0	II. N.
28	17 57.28	2.095	22 23 48 65	135.91	− 4 55 7.8	706.7	66.68	16 0.3	58 37.9	II. N.
29	18 47.87	2.126	23 18 28.87	137.75	− 0 3 47.8	743.3	67.14	16 10.0	59 13.3	II. N.
30	19 39.57	2.188	0 14 16.09	141.49	+ 4 53 38.8	736.0	68.03	16 18.4	59 44.4	II. N.
31	20 33.11	2.277	1 11 53.56	146.84	9 38 27.5	679.0	69.30	16 24.8	60 7.8	II. N.
June 1	21 28.96	2.377	2 11 50.32	152.92	+13 49 40.5	+567.7	70.70	16 28.1	60 19.9	II. N.
2	22 27.11	2.463	3 14 5.28	158.05	17 5 50.9	405.3	71.89	16 27.5	60 17.7	II. N.
3	23 26.82	2.503	4 17 54.73	160.46	19 8 48.8	+205.1	72.44	16 23.0	60 0.2	II. N.
5	0 26.73	2.476	5 21 55.11	158.85	19 48 13.9	− 7.9	72.05	16 14.2	59 28.4	I. N.
6	1 25.16	2.383	6 24 27.55	153.29	19 4 30.2	−206.1	70.75	16 2.3	58 45.0	I. N.
7	2 20.80	2.249	7 24 11.99	145.15	+17 7 54.2	−369.8	68.81	15 48.6	57 54.7	I. N.
8	3 13.00	2.102	8 20 29.32	136.31	14 14 25.7	−490.9	66.68	15 34.4	57 2.7	I. N.
9	4 1.80	1.969	9 13 21.97	128.30	10 41 14.2	−569.3	64.69	15 20.9	56 12.9	I. N.
10	4 47.74	1.865	10 3 21.59	122.00	6 43 40.3	−613.4	63.07	15 9.0	55 29.4	I. N.
11	5 31.57	1.795	10 51 14.93	117.81	+ 2 34 18.1	−629.3	61.97	14 59.5	54 54.7	I. N.
12	6 14.16	1.761	11 37 54.18	115.89	− 1 36 44.8	−622.4	61.44	14 52.7	54 29.4	I. N.
13	6 56.38	1.763	12 24 11.29	115.95	− 5 40 56.2	−595.2	61.45	14 48.8	54 15.3	I. N.
14	7 39.05	1.798	13 10 54.91	118.00	− 9 30 18.8	−548.3	61.95	14 47.9	54 11.7	I. N.
15	8 22.87	1.858	13 58 47.75	121.64	−12 56 42.3	−480.0	62.87	14 49.6	54 18 0	I. N.
16	9 8.39	1.938	14 48 23.08	126.44	−15 51 12.3	−388.5	64.07	14 53.6	54 33.0	I. N.
17	9 55.93	2.024	15 40 0.02	131.64	−18 4 10.5	−272.3	65.37	14 59.7	54 55.2	I. N.
18	10 45.50	2.103	16 33 38.42	136.40	−19 25 54.6	−132.7	66.54	15 7.2	55 22.8	I. N.
19	11 36.71	2.160	17 28 56.61	139.82	−19 48 2.6	+ 24.4	67.37	15 15.6	55 53.6	I. N.
20	12 28.93	2.185	18 25 14.80	141.32	−19 5 19.9	189.5	67.76	15 24.5	56 26.2	II. N.
21	13 21.36	2.179	19 21 46.18	140.99	−17 17 10.4	349.4	67.70	15 33.2	56 58.4	II. N.
22	14 13.37	2.159	20 17 51.51	139.30	−14 28 10.1	+491.8	67.33	15 41.6	57 29.2	II. N.
23	15 4.60	2.119	21 13 10.70	137.31	−10 47 28.0	606.4	66.87	15 49.4	57 57.8	II. N.
24	15 55.14	2.096	22 7 47.34	135.92	− 6 27 31.2	687.0	66.58	15 56.5	58 23.7	II. N.
25	16 45.37	2.095	23 2 5.88	135.90	− 1 42 49.9	729.8	66.62	16 2.7	58 46.6	II. N.
26	17 35.94	2.125	23 56 45.02	137.68	+ 3 10 45.0	731.1	67.09	16 8.0	59 6.0	II. N.
27	18 27.59	2.185	0 52 28.95	141.27	+ 7 56 13.7	+688.7	67.99	16 12.1	59 21.2	II. N.
28	19 20.97	2 266	1 49 56.84	146.22	12 15 31.3	599.9	69.19	16 14.7	59 30.7	II. N.
29	20 16.42	2.353	2 49 30.01	151.49	15 50 0.2	464.9	70.42	16 15.4	59 33.1	II. N.
30	21 13.80	2.421	3 50 58.66	155 55	18 22 16.1	290.6	71.35	16 13.6	59 26.8	II. N.
31	22 12.28	2.442	4 53 34.21	156.82	+19 39 8.4	+ 91.5	71.60	16 9.3	59 10.7	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 1	22 12.28	2.442	4 53 34.21	156.82	+19 39 8.4	+ 91.5	71.60	16 9.3	59 10.7	II. N.
2	23 10.58	2.404	5 55 57.72	154.50	19 35 3.5	−110.0	71.01	16 2.1	58 44.8	II. N.
4	0 7.25	2.311	6 56 43.90	148.90	18 13 44.5	−291.2	69.64	15 52.8	58 10.4	I. II. N.
5	1 1.25	2.187	7 54 49.21	141.36	15 46 48.3	−436.4	67.81	15 41.8	57 29.8	I. N.
6	1 52.12	2.056	8 49 46.64	133.49	12 30 11.3	−539.5	65.86	15 30.0	56 46.5	I. N.
7	2 40.00	1.939	9 41 43.89	126.51	+ 8 40 28.0	−603.3	64.11	15 18.4	56 4.0	I. N.
8	3 25.41	1.851	10 31 12.43	121.19	4 32 27.6	−632.1	62.76	15 7.9	55 25.5	I. N.
9	4 9.09	1.795	11 18 56.32	117.82	+ 0 18 27.6	−633.9	61.91	14 59.3	54 53.8	I. N.
10	4 51.82	1.773	12 5 44.24	116.52	− 3 51 30.5	−612.8	61.60	14 53.1	54 30.9	I. N.
11	5 34.44	1.784	12 52 24.99	117.20	− 7 48 57.1	−571.2	61.81	14 49.6	54 18.1	I. N.
12	6 17.70	1.836	13 39 44.29	119.68	−11 25 58.6	−510.5	62.48	14 49.1	54 16.3	I. N.
13	7 2.27	1.892	14 28 22.08	123.67	−14 34 33.8	−428.9	63.52	14 51.6	54 25.2	I. N.
14	7 48.64	1.975	15 18 48.76	128.69	−17 6 4.7	−324.9	64.78	14 56.7	54 44.3	I. N.
15	8 37.09	2.062	16 11 20.08	133.92	−18 51 18.4	−197.0	66.07	15 4.3	55 12.2	I. N.
16	9 27.55	2.140	17 5 52.46	138.59	−19 41 10.2	− 48.5	67.19	15 13.8	55 47.1	I. N.
17	10 19.62	2.193	18 2 1.24	141.85	−19 28 14.2	+115.0	67.95	15 24.5	56 26.3	I. N.
18	11 12.59	2.216	18 59 5.62	143.19	−18 8 34.6	282.8	68.24	15 35.5	57 6.7	I. N.
19	12 5.75	2.209	19 56 20.27	142.77	−15 43 24.9	440.3	68.12	15 46.0	57 45.4	I. II. N.
20	12 58.49	2.184	20 53 9.63	141.24	−12 19 31.0	574.0	67.75	15 55.3	58 19.6	II. N.
21	13 50.54	2.155	21 49 17.97	139.51	− 8 8 52.2	672.8	67.36	16 2.8	58 47.1	II. N.
22	14 42.02	2.138	22 44 51.75	138.48	− 3 26 54.8	+719.8	67.15	16 8.2	59 6.7	II. N.
23	15 33.34	2.143	23 40 15.68	138.76	+ 1 28 52.3	741.5	67.27	16 11.4	59 18.3	II. N.
24	16 25.07	2.173	0 36 4.67	140.58	6 20 11.1	707.4	67.77	16 12.5	59 22.5	II. N.
25	17 17.81	2.226	1 32 54.34	143.74	10 48 43.7	627.8	68.59	16 11.8	59 20.0	II. N.
26	18 11.98	2.290	2 31 10.07	147.60	14 36 53.1	506.2	69.55	16 9.6	59 12.2	II. N.
27	19 7.65	2.347	3 30 56.13	151.06	+17 28 43.9	+347.8	70.36	16 6.1	58 59.2	II. N.
28	20 4.41	2.377	4 31 47.60	152.86	19 11 44.2	+164.1	70.75	16 1.4	58 41.8	II. N.
29	21 1.39	2.363	5 32 51.97	151.99	19 38 54.7	− 28.4	70.48	15 55.4	58 19.7	II. N.
30	21 57.46	2.302	6 33 2.12	148.38	18 50 24.1	−211.2	69.53	15 48.2	57 53.2	II. N. s.
31	22 51.62	2.207	7 31 17.36	142.62	16 53 27.8	−368.2	68.06	15 39.9	57 22.9	II. N. s.
Aug. 1	23 43.25	2.095	8 27 0.29	135.91	+14 0 36.3	−489.7	66.37	15 30.9	56 49.7	II. N.
3	0 32.21	1.987	9 20 2.27	129.36	10 26 48.4	−572.9	64.71	15 21.4	56 15.0	I. N.
4	1 18.75	1.896	10 10 38.89	123.89	6 27 5.5	−619.9	63.30	15 12.1	55 40.9	I. N.
5	2 3.40	1.830	10 59 21.60	119.94	+ 2 15 2.0	−635.4	62.29	15 3.6	55 9.7	I. N.
6	2 46.81	1.793	11 46 49.94	117.72	− 1 57 43.9	−624.9	61.76	14 56.5	54 43.5	I. N.
7	3 29.69	1.785	12 33 46.29	117.98	− 6 1 22.6	−590.4	61.71	14 51.3	54 24.5	I. N.
8	4 12.73	1.806	13 20 52.60	118.52	− 9 47 18.4	−536.0	62.09	14 48.6	54 14.3	I. N.
9	4 56.58	1.853	14 8 47.58	121.30	−13 7 34.5	−462.0	62.87	14 48.5	54 14.2	I. N.
10	5 41.80	1.919	14 58 4.26	125.27	−15 54 17.2	−368.2	63.94	14 51.4	54 24.8	I. N.
11	6 28.77	1.996	15 49 6.22	129.98	−17 59 17.3	−253.3	65.16	14 57.3	54 46.4	I. N.
12	7 17.64	2.076	16 42 3.72	134.78	−19 14 16.7	−118.3	66.35	15 5.9	55 18.1	I. N.
13	8 8.34	2.146	17 36 50.51	138.96	−19 31 30.5	+ 34.6	67.35	15 16.9	55 58.7	I. N.
14	9 0.48	2.194	18 33 3.88	141.92	−18 45 4.7	198.6	68.03	15 29.7	56 45.5	I. N. s.
15	9 53.49	2.219	19 30 10.21	143.36	−16 52 34.8	363.0	68.33	15 43.3	57 35.2	I. N. S.
16	10 46.82	2.222	20 27 34.96	143.52	−13 56 32.3	+513 9	68.31	15 56.4	58 23.5	I. N. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 16	10 46.82	2.222	20 27 34.96	143.52	−13 56 32.3	+513.9	68.31	15 56.4	58 23.5	I. N. S.
17	11 40.04	2.212	21 24 53.49	142.96	−10 5 7.4	637.5	68.15	16 8.0	59 6.1	I. N. s.
18	12 33.02	2.204	22 21 57.86	142.46	− 5 31 52.3	721.3	68.03	16 17.0	59 39.6	II. N.
19	13 25.93	2.207	23 18 57.30	142.64	− 0 34 31.7	756.6	68.10	16 22.5	59 59.4	II. N.
20	14 19.10	2.237	0 16 13.19	143.86	+ 4 26 36.8	739.9	68.46	16 24.2	60 5.9	II. N.
21	15 12.97	2.264	1 14 10.53	146.05	+ 9 10 31.5	+671.2	69.04	16 22.5	59 59.5	II. N.
22	16 7.83	2.308	2 13 7.75	148.74	13 17 15.5	555.2	69.71	16 17 9	59 42.4	II. N.
23	17 3.72	2.347	3 13 6.87	151.04	16 29 37.8	401.2	70.31	16 11.1	59 17.5	II. N.
24	18 0.29	2.362	4 13 46.97	151.99	18 34 52.1	222.0	70.59	16 3.0	58 47.7	II. N.
25	18 56.83	2.343	5 14 25.13	150.80	19 26 3.2	+ 33.8	70.28	15 54.2	58 15.4	II. N.
26	19 52.43	2.285	6 14 7.02	147.34	+19 2 51.7	−147.1	69.39	15 45.2	57 42.4	II. N. s.
27	20 46.27	2.198	7 12 2.75	142.10	17 31 9.3	−306.9	68.04	15 36.3	57 9.6	II. n. S.
28	21 37.92	2.097	8 7 40.54	135.99	15 1 24.0	−436.3	66.44	15 27.6	56 37.6	II. S.
29	22 26.93	1.997	9 0 51.42	130.00	11 46 35.5	−531.9	64.85	15 19.2	56 6.8	II. n. S.
30	23 13.78	1.911	9 51 47.11	124.82	8 0 24.9	−593.5	63.47	15 11.2	55 37.5	II. N. S.
31	23 58.92	1.846	10 40 53.10	120.91	+ 3 56 0.0	−623.5	62.42	15 3.8	55 10.4	I. II. N.
Sept. 2	0 42.58	1 805	11 28 42.73	118.48	− 0 14 40.1	−625.4	61.78	14 57.3	54 46.4	I. N.
3	1 25.68	1.790	12 15 52.26	117.57	− 4 20 53.7	−601.9	61.57	14 51.9	54 26.5	I. N.
4	2 8.70	1.799	13 2 57.66	118.12	− 8 13 8.3	−555.7	61.78	14 48.1	54 12.5	I. N.
5	2 52.22	1.831	13 50 32.41	119.98	−11 42 44.8	−489.0	62.35	14 46.2	54 5.6	I. N.
6	3 36.71	1.880	14 39 5.37	122.93	−14 41 38.4	−402.4	63.19	14 46.7	54 7.3	I. N.
7	4 22.53	1.940	15 28 58.58	126.59	−17 2 5.0	−296.7	64.22	14 49.8	54 18.7	I. N.
8	5 9.89	2.007	16 20 24.80	130.59	−18 36 38.2	−173.1	65.29	14 55.7	54 40.4	I. N.
9	5 58.83	2.070	17 13 25.66	134.41	−19 18 24.5	− 33.3	66.28	15 4.5	55 12.9	I. N.
10	6 49.18	2.121	18 7 51.28	137.56	−19 1 39.0	+118.6	67.07	15 16.0	55 55.2	I. N. s.
11	7 40.62	2.161	19 3 23.12	139.91	−17 42 41.6	+276.5	67.60	15 29.8	56 45.9	I. n. S
12	8 32.81	2.186	19 59 39.75	141.36	−15 21 2.8	430.4	67.90	15 45.1	57 42.0	I. S.
13	9 25.47	2.201	20 56 24.07	142.28	−12 0 26.2	569.2	68.07	16 0.7	58 39.2	I. S.
14	10 18.47	2.216	21 53 29.23	143.19	− 7 49 33.9	679.6	68.23	16 15.1	59 32.3	I. S.
15	11 11.90	2.239	22 51 0.82	144.56	− 3 2 24.0	748.5	68.53	16 26.9	60 15.5	I. N. S.
16	12 6.04	2.276	23 49 14.71	146.74	+ 2 2 14.5	+765.3	69.05	16 34.6	60 43.8	II. N.
17	13 1.21	2.324	0 48 30.06	149.64	7 2 1.1	723.7	69.78	16 37.4	60 54.1	II. N.
18	13 57.60	2.376	1 48 59.64	152.80	11 33 21.4	623.8	70.58	16 35.1	60 45.7	II. N.
19	14 55.16	2.417	2 50 38.68	155.96	15 14 26.3	474.5	71.24	16 28.4	60 21.0	II. N.
20	15 53.37	2.428	3 52 57.98	155.99	17 48 28.1	291.7	71.47	16 18.4	59 44.2	II. N.
21	16 51.40	2.399	4 55 5.53	154.90	+19 6 3.9	+ 96.0	71.09	16 6.3	58 59.9	II. N.
22	17 48.20	2.327	5 55 59.55	149.92	19 6 10.0	− 92.7	70.08	15 53.6	58 13.2	II. N. s.
23	18 42.89	2.227	6 54 46.90	143.81	17 54 55.7	−256.7	68.57	15 41.1	57 27.4	II. S.
24	19 34.98	2.114	7 50 56.88	137.00	15 43 15.9	−394.0	66.83	15 29.5	56 44.8	II. S.
25	20 24.37	2.005	8 44 24.89	130.47	12 44 11.7	−495.8	65.10	15 19.2	56 6.9	II. S.
26	21 11.34	1.912	9 35 27.38	124.96	+ 9 10 55.6	−565.3	63.60	15 10.3	55 33.8	II. S.
27	21 56.38	1.845	10 24 34.17	120.86	5 15 52.2	−605.2	62.44	15 2.6	55 5.7	II. S.
28	22 40.11	1.803	11 12 21.21	118.32	+ 1 10 24.6	−617.8	61.72	14 56.2	54 42.4	II. S.
29	23 23.13	1.786	11 59 25.74	117.30	− 2 55 2.0	−605.3	61.42	14 51.1	54 23.7	II. n. S.
31	0 6.02	1.792	12 46 23.18	117.69	− 6 50 44.3	−569.4	61.52	14 47.3	54 9.7	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	0 6.02	1.792	12 46 23.18	117.69	− 6 50 44.3	−569.4	61 52	14 47.3	54 9.7	I. N.
2	0 49.32	1.819	13 33 44.95	119.30	−10 27 34.0	−511.2	61.98	14 44.9	54 0.9	I. N.
3	1 33.46	1.861	14 21 56.69	121.83	−13 36 50.4	−431.8	62.70	14 44.1	53 58.4	I. N.
4	2 18.71	1.912	15 11 16.36	124.89	−16 10 22.3	−332.7	63.57	14 45.2	54 1.9	I. N.
5	3 5.25	1.966	16 1 52.74	128.13	−18 0 39.6	−215.9	64.48	14 48.4	54 13.6	I. N.
6	3 53.05	2.016	16 53 44.87	131.13	−19 1 10.9	− 84.5	65.33	14 54.0	54 34.2	I. N.
7	4 41.94	2.057	17 46 42.65	133.58	−19 6 48.8	+ 57.7	66.02	15 2.2	55 4.3	I. N. S.
8	5 31.67	2.086	18 40 31.65	135.37	−18 14 19.3	205.1	66.49	15 13.0	55 44.1	I. S.
9	6 22.00	2.107	19 34 56.19	136.61	−16 22 50.0	351.4	66.80	15 26.3	56 32.8	I. S.
10	7 12.77	2.124	20 29 47.33	137.66	−13 34 16.0	489.2	67.04	15 41.5	57 28.9	I. S.
11	8 4.00	2.147	21 25 6.23	139.01	− 9 53 49.0	+609.2	67.33	15 57.9	58 28.9	I. S.
12	8 55.91	2.182	22 21 6.02	141.14	− 5 30 35.2	701.2	67.80	16 14.1	59 28.3	I. S.
13	9 48.89	2.237	23 18 10.08	144.40	− 0 38 11.2	752.9	68.54	16 28.4	60 20.9	I. S.
14	10 43.41	2.310	0 16 46.38	148.80	+ 4 24 50.2	752.0	69.57	16 39.2	61 0.5	I. S.
15	11 39.84	2.394	1 17 18.04	153.88	9 15 35.0	690.6	70.77	16 44.9	61 21.5	I. ii. N. s.
16	12 38.27	2.472	2 19 50.01	158.60	+13 28 59.9	+566.6	71.91	16 44.7	61 20.9	II. N.
17	13 38.27	2.520	3 23 56.20	161.47	16 41 50.1	390.6	72.63	16 38.7	60 58.9	II. N.
18	14 38.81	2.514	4 28 34.96	161.15	18 37 31.5	+185.1	72.61	16 28.0	60 19.5	II. N.
19	15 38.48	2.448	5 32 21.83	157.17	19 9 43.4	− 22.4	71.74	16 14.1	59 28.8	II. N. S.
20	16 35.96	2.335	6 33 56.18	150.32	18 22 37.9	−208.1	70.15	15 58.6	58 31.6	II. S.
21	17 30.36	2.198	7 32 25.87	142.12	+16 27 59.8	−358.8	68.16	15 43.2	57 35.1	II. S.
22	18 21.45	2.062	8 27 36.23	133.91	13 40 50.7	−470.8	66.12	15 28.9	56 42.6	II. S.
23	19 9.49	1.946	9 19 43.63	126.94	10 16 10.3	−547.1	64.27	15 16.4	55 56.6	II. S.
24	19 55.09	1.859	10 9 23.53	121.68	6 27 19.4	−592.4	62.82	15 6.0	55 18.3	II. S
25	20 38.97	1.803	10 57 19.70	118.31	+ 2 25 45.2	−611.3	61.86	14 57.7	54 48.0	II. S.
26	21 21.87	1.777	11 44 17.16	116.77	− 1 38 32.0	−606.4	61.39	14 51.5	54 25.2	II. S.
27	22 4.49	1.779	12 30 58.12	116.89	− 5 36 23.6	−579.3	61.37	14 47.2	54 9.4	II. S.
28	22 47.45	1.805	13 17 59.47	118.43	− 9 19 1.5	−530.3	61.73	14 44.6	53 50.9	II. S.
29	23 31.24	1.847	14 5 50.62	120.98	−12 37 42.4	−459.5	62.39	14 43.6	53 56.0	II. n. S.
31	0 16.19	1.900	14 54 51.49	124.14	−15 23 49.3	−367.6	63.23	14 44.1	53 57.7	I. N. s.
Nov. 1	1 2.43	1.953	15 45 10.33	127.38	−17 29 9.5	−256.1	64.11	14 46.0	54 4.8	I. N. s.
2	1 49.90	2.000	16 36 42.82	130.21	−18 46 33.2	−128.5	64.90	14 49.6	54 18.0	I. N. s.
3	2 38.34	2.033	17 29 13.55	132.20	−19 10 31.6	+ 10.1	65.49	14 55.0	54 37.8	I. n. S.
4	3 27.38	2.051	18 22 20.72	133.25	−18 37 56.0	153.1	65.83	15 2.3	55 4.5	I. S.
5	4 16.68	2.055	19 15 43.08	133.52	−17 8 18.0	293.9	65.96	15 11.6	55 39.0	I. S.
6	5 6.00	2.055	20 9 7.41	133.50	−14 43 48.9	+426.3	65.99	15 23.0	56 21.1	I. S.
7	5 55.36	2.060	21 2 33.60	133.78	−11 29 9.8	544.0	66.07	15 36.4	57 10.3	I. S.
8	6 45.00	2.081	21 56 16.76	135.01	− 7 31 29.9	640.3	66.37	15 51.3	58 4.9	I. S.
9	7 35.41	2.125	22 50 45.86	137.70	− 3 0 42.8	708.0	67.01	16 6.8	59 1.5	I. S.
10	8 27.22	2.198	23 46 39.48	142.09	+ 1 49 50.6	737.5	68.05	16 21.5	59 55.6	I. S.
11	9 21.11	2.297	0 44 38.42	148.06	+ 6 42 37.3	+717.3	69.46	16 33.8	60 41.0	I. S.
12	10 17.60	2.412	1 45 14.04	154.95	11 15 46.1	638.1	71.06	16 42.3	61 12.1	I. S.
13	11 16.79	2.516	2 48 31.38	161.25	15 4 45.1	497.0	72.53	16 45.4	61 23.5	I. S.
14	12 18.04	2.577	3 53 53.27	164.98	17 46 28.4	304.9	73.40	16 42.5	61 12.9	II. n. S.
15	13 19.98	2.569	4 59 56.49	164.50	+19 5 2.8	+ 86.5	73.32	16 34.0	60 41.5	II. n. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 16	14 20.80	2.487	6 4 52.56	159.47	+18 56 22.9	−126.2	72.21	16 21.0	59 53.9	II. S.
17	15 18.94	2.350	7 7 5.62	151.23	17 28 23.5	−307.0	70.30	16 5.4	58 56.4	II. S.
18	16 13.44	2.192	8 5 41.86	141.74	14 56 46.1	−443.5	68.04	15 48.8	57 55.5	II. S.
19	17 4.24	2.045	9 0 34.79	132.87	11 39 31.4	−535.8	65.84	15 32.8	56 56.9	II. S.
20	17 51.80	1.924	9 52 12.40	125.60	7 53 10.8	−590.3	63.98	15 18.5	56 4.4	II. S.
21	18 36.87	1.838	10 41 20.75	120.46	+ 3 51 23.4	−614.3	62.60	15 6.5	55 20.4	II. S.
22	19 20.32	1.789	11 28 51.81	117.46	− 0 14 53.4	−613.4	61.76	14 57.2	54 46.0	II. S.
23	20 3.01	1.774	12 15 36.60	116.57	− 4 16 31.9	−591.4	61.46	14 50.5	54 21.4	II. S.
24	20 45.70	1.788	13 2 21.49	117.44	− 8 5 19.0	−549.3	61.63	14 46.4	54 6.2	II. S.
25	21 29.04	1.827	13 49 45.58	119.76	−11 33 12.4	−486.1	62.19	14 44.5	53 59.5	II. S.
26	22 13.52	1.882	14 38 18.29	123.07	−14 31 57.0	−403.4	63.01	14 44.7	54 0.0	II. S
27	22 59.42	1.943	15 28 16.31	126.77	−16 53 9.3	−299.1	63.94	14 46.5	54 6.9	II. S.
28	23 46.76	2.000	16 19 41.09	130.19	−18 28 47.9	−176.1	64.81	14 49.8	54 19.0	I. II. N. S.
30	0 35.31	2.042	17 12 18.26	132.72	−19 12 9.0	− 38.7	65.47	14 54.4	54 35.8	I. N. S.
Dec. 1	1 24.61	2.062	18 5 41.10	133.95	−18 58 50.3	+106.8	65.82	15 0.2	54 57.2	I. S.
2	2 14.15	2.062	18 59 18.08	133.93	−17 47 39.4	+249.1	65.88	15 7.1	55 22.6	I. S.
3	3 3.48	2.047	19 52 42.93	133.04	−15 40 47.4	383.0	65.72	15 15.3	55 52.6	I. S.
4	3 52.41	2.030	20 45 42.99	131.99	−12 43 27.4	500.4	65.51	15 24.7	56 27.0	I. S.
5	4 41.01	2.022	21 38 23.40	131.53	− 9 3 15.7	596.5	65.45	15 35.3	57 6.1	I. S.
6	5 29.65	2.036	22 31 7.04	132.36	− 4 49 42.1	666.5	65.69	15 47.0	57 49.0	I. S.
7	6 18.97	2.080	23 24 31.00	134.96	− 0 14 9.6	+705.5	66.35	15 59.3	58 34.1	I. S.
8	7 9.73	2.157	0 19 21.30	139.56	+ 4 29 38.5	706.6	67.48	16 11.5	59 18.9	I. S.
9	8 2.71	2.263	1 16 24.65	145.97	9 4 57.0	661.6	69.02	16 22.5	59 59.4	I. S.
10	8 58.46	2.385	2 16 15.99	153.36	13 11 45.9	563.1	70.75	16 31.1	60 30.8	I. S.
11	9 57.12	2.498	3 19 1.57	160.16	16 28 5.9	409.9	72.30	16 35.8	60 48.2	I. S
12	10 58.02	2.566	4 24 2.27	164.27	+18 33 31.3	+211.5	73.22	16 35.8	60 48.3	I. S.
13	11 59.72	2.561	5 29 50.86	163.97	19 14 36.2	− 6.9	73 15	16 30.8	60 29.8	I. II. S.
14	13 0.35	2.479	6 34 35.15	159.02	18 29 23.6	−214.7	72.00	16 21.1	59 53.5	II. S.
15	13 58.29	2.343	7 36 37.53	150.81	16 27 42.9	−386.1	70.00	16 7.7	59 5.1	II. S.
16	14 52.65	2.187	8 35 4.74	141.44	13 26 55.7	−509.5	67.86	15 52.4	58 9.3	II. S.
17	15 43.35	2.042	9 29 51.80	132.70	+ 9 46 22.1	−586.0	65.72	15 36.9	57 12.0	II. S.
•18	16 30.89	1.925	10 21 28.22	125.68	5 43 25.9	−622.8	63.95	15 22.3	56 18.3	II. S.
19	17 16.04	1.844	11 10 41.37	120.79	+ 1 32 10.2	−628.9	62 69	15 9.6	55 31.5	II. S.
20	17 59.69	1.800	11 58 24.22	118.14	− 2 36 28.8	−610 6	61.99	14 59.4	54 54.2	II. S.
21	18 42.71	1.790	12 45 28.67	117.57	− 6 33 43.6	−572.3	61.82	14 52.1	54 27.3	II. S.
22	19 25.87	1.811	13 32 41.76	118.80	−10 11 52.1	−515.2	62.12	14 47.7	54 11.3	II. S.
23	20 9.82	1.856	14 20 43.14	121.51	−13 23 26.6	−439.3	62.78	14 46.2	54 5.8	II. S.
24	20 55.07	1.917	15 10 1.95	125.14	−16 0 46.6	−344.0	63.68	14 47.3	54 9.6	II. S.
25	21 41.86	1.982	16 0 53.37	129.11	−17 55 59.1	−228.9	64.64	14 50.6	54 21.6	II. S.
26	22 30.15	2.040	16 53 15.68	132.61	−19 1 33.4	− 96.3	65.48	14 55.6	54 40.1	II. S.
27	23 19.65	2.080	17 46 49.97	135.02	−19 11 26.9	+ 48.4	66.05	15 2 0	55 3.5	II. S.
29	0 9.81	2.095	18 41 4.60	135.95	−18 22 21.2	196.9	66.28	15 9.2	55 30.0	I. II. S.
30	1 0.06	2.088	19 35 24.40	135.50	−16 34 40.5	339.5	66.18	15 17.0	55 58.6	I. S.
31	1 49.93	2.066	20 29 21.53	134.17	−13 52 47.9	466 6	65.89	15 25.0	56 24.2	I. S.
32	2 39.23	2.043	21 22 42.14	132.75	−10 24 35.2	+570.2	65.58	15 33.2	56 58.2	I. S.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	0 41.4	19 21 33.47	−24 17 21.7	6.5	2.4	0.18	Feb. 14	22 58.5	20 39 47.20	−15 30 11.0	12.6	4.7	0.33
1	0 44.5	19 28 39.61	24 3 34.9	6.5	2.5	0.18	15	22 53.7	20 38 55.80	15 45 45.1	12.4	4.7	0.32
2	0 47.7	19 35 44.49	23 48 12.9	6.6	2.5	0.18	16	22 49.4	20 38 34.61	15 59 51.3	12.2	4.6	0.32
3	0 50.8	19 42 47.72	23 31 15.9	6.6	2.5	0.18	17	22 45.6	20 38 42.31	16 12 25.8	11.9	4.5	0.31
4	0 53.8	19 49 48.87	23 12 44.2	6.7	2.5	0.18	18	22 42.3	20 39 17.43	16 23 26.4	11.7	4.4	0.31
5	0 56.8	19 56 47.46	−22 52 38.6	6.8	2.5	0.18	19	22 39.4	20 40 18.38	−16 32 52.1	11.4	4.3	0.30
6	0 59.8	20 3 42.95	22 31 0.2	6.9	2.6	0.19	20	22 36.9	20 41 43.47	16 40 42.1	11.2	4.2	0.30
7	1 2.7	20 10 34.71	22 7 50.4	7.0	2.6	0.19	21	22 34.7	20 43 31.04	16 46 56.1	11.0	4.2	0.29
8	1 5.5	20 17 22.03	21 43 11.4	7.1	2.6	0.19	22	22 32.9	20 45 39.47	16 51 34.6	10.8	4.1	0.28
9	1 8.3	20 24 4.17	21 17 6.1	7.2	2.7	0.20	23	22 31.4	20 48 7.19	16 54 38.2	10.6	4.0	0.28
10	1 11.0	20 30 40.22	−20 49 37.9	7.3	2.7	0.20	24	22 30.2	20 50 52.71	−16 56 7.5	10.4	3.9	0.27
11	1 13.5	20 37 9.18	20 20 51.0	7.4	2.8	0.20	25	22 29.3	20 53 54.61	16 56 3.3	10.2	3.9	0.27
12	1 15.9	20 43 29.88	19 50 50.9	7.5	2.8	0.20	26	22 28.7	20 57 11.59	16 54 26.5	10.0	3.8	0.26
13	1 18.2	20 49 41.06	19 19 44.4	7.7	2.9	0.20	27	22 28.3	21 0 42.42	16 51 18.0	9.8	3.7	0.26
14	1 20.3	20 55 41.27	18 47 39.3	7.8	2.9	0.21	28	22 28.1	21 4 26.00	16 46 38.8	9.6	3.6	0.25
15	1 22.1	21 1 28.87	−18 14 45.2	7.9	3.0	0.21	Mar. 1	22 28.0	21 8 21.28	−16 40 30.0	9.5	3.6	0.25
16	1 23.6	21 7 2.00	17 41 13.0	8.1	3.1	0.21	2	22 28.1	21 12 27.29	16 32 52.4	9.3	3.5	0.25
17	1 24.9	21 12 18.63	17 7 15.8	8.3	3.1	0.22	3	22 28.5	21 16 43.19	16 23 46.9	9.2	3.5	0.24
18	1 25.9	21 17 16.52	16 33 8.9	8.5	3.2	0.22	4	22 29.0	21 21 8.19	16 13 14.5	9.0	3.4	0.24
19	1 26.6	21 21 53.24	15 59 9.1	8.7	3.3	0.23	5	22 29.6	21 25 41.56	16 1 16.1	8.9	3.4	0.23
20	1 26.9	21 26 6.14	−15 25 35.3	8.9	3.4	0.23	6	22 30.4	21 30 22.65	−15 47 52.4	8.8	3.3	0.23
21	1 26.7	21 29 52.41	14 52 49.1	9.2	3.5	0.24	7	22 31.2	21 35 10.87	15 33 4.3	8.7	3.3	0.23
22	1 26.1	21 33 9.19	14 21 13.6	9.5	3.6	0.24	8	22 32.1	21 40 5.69	15 16 52.9	8.6	3.2	0.23
23	1 24.9	21 35 53.58	13 51 13.5	9.8	3.7	0.25	9	22 33.2	21 45 6.63	14 59 19.0	8.4	3.2	0.22
24	1 23.1	21 38 2.73	13 23 14.3	10.1	3.8	0.26	10	22 34.4	21 50 13.25	14 40 23.3	8.3	3.1	0.22
25	1 20.6	21 39 34.03	−12 57 42.2	10.4	3.9	0.27	11	22 35.7	21 55 25.17	−14 20 6.4	8.2	3.1	0.22
26	1 17.6	21 40 25.21	12 35 2.7	10.7	4.0	0.27	12	22 37.0	22 0 42.04	13 58 29.2	8.1	3.1	0.21
27	1 13.8	21 40 34.57	12 15 40.1	11.0	4.1	0.28	13	22 38.4	22 6 3.54	13 35 32.3	8.1	3.0	0.21
28	1 9.4	21 40 1.07	11 59 55.3	11.4	4.3	0.29	14	22 39.8	22 11 29.47	13 11 16.6	8.0	3.0	0.21
29	1 4.2	21 38 44.69	11 48 5.5	11.8	4.4	0.30	15	22 41.4	22 16 59.58	12 45 42.7	7.9	3.0	0.20
30	0 58.3	21 36 46.40	−11 40 23.3	12.1	4.6	0.31	16	22 43.1	22 22 33.65	−12 18 51.3	7.8	2.9	0.20
31	0 51.7	21 34 8.44	11 36 53.9	12.4	4.7	0.32	17	22 44.8	22 28 11.53	11 50 43.1	7.7	2.9	0.20
Feb. 1	0 44.5	21 30 54.33	11 37 35.4	12.6	4.9	0.32	18	22 46.5	22 33 53.08	11 21 18.9	7.6	2.9	0.20
2	0 36.8	21 27 8.87	11 42 18.7	12.8	5.0	0.33	19	22 48.3	22 39 38.19	10 50 39.3	7.6	2.9	0.19
3	0 28.8	21 22 57.99	11 50 47.6	13.1	5.0	0.34	20	22 50.1	22 45 26.76	10 18 44.8	7.5	2.8	0.19
4	0 20.4	21 18 28.48	−12 2 38.0	13.3	5.1	0.34	21	22 52.0	22 51 18.78	− 9 45 36.2	7.4	2.8	0.19
5	0 11.8	21 13 47.78	12 17 21.3	13.5	5.1	0.35	22	22 54.0	22 57 14.16	9 11 14.3	7.3	2.8	0.19
6	0 3.1	21 9 3.52	12 34 25.3	13.6	5.2	0.35	23	22 56.1	23 3 12.91	8 35 39.7	7.3	2.8	0.19
6	23 54.5	21 4 23.14	12 53 16.0	13.6	5.2	0.35	24	22 58.2	23 9 15.05	7 58 53.1	7.2	2.8	0.19
7	23 46.1	20 59 53.57	13 13 19.0	13.6	5.2	0.36	25	23 0.3	23 15 20.60	7 20 55.3	7.2	2.7	0.18
8	23 38.0	20 55 40 89	−13 34 2.7	13.5	5.1	0.35	26	23 2.5	23 21 29.61	− 6 41 47.1	7.1	2.7	0.18
9	23 30.2	20 51 50.15	13 54 58.3	13.5	5.1	0.35	27	23 4.8	23 26 42.15	6 1 29.5	7.1	2.7	0.18
10	23 22.8	20 48 25.33	14 15 40.3	13.4	5.1	0.35	28	23 7.1	23 32 58.30	5 20 3.4	7.0	2.7	0.18
11	23 16.0	20 45 29.25	14 35 47.8	13.2	5.0	0.34	29	23 9.5	23 39 18.16	4 37 29.8	6.9	2.6	0.18
12	23 9.7	20 43 3.75	14 55 3.7	13.0	4.9	0.34	30	23 11.9	23 45 41.85	3 53 49.7	6.9	2.6	0.17
13	23 3.8	20 41 9.68	−15 13 14.7	12.8	4.8	0.33	31	23 14.4	23 53 9.51	− 3 9 4.3	6.8	2.6	0.17
14	22 58.5	20 39 47.20	−15 30 11.0	12.6	4.7	0.33	32	23 17.0	23 59 41.28	− 2 23 15.3	6.8	2.6	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	23 17.0	23 59 41.28	− 2 23 15.3	6.8	2.6	0.17	May 18	1 25.3	5 9 38.83	+24 55 8.5	11.8	4.4	0.32
2	23 19.7	0 6 17.31	1 36 24.1	6.8	2.6	0.17	19	1 24.1	5 12 23.84	24 49 57.7	12.1	4.5	0.33
3	23 22.4	0 12 57.78	− 0 48 32.6	6.7	2.6	0.17	20	1 22.5	5 14 48.59	24 43 17.1	12.4	4.7	0.34
4	23 25.2	0 19 42.84	+ 0 0 17.3	6.7	2.5	0.17	21	1 20.6	5 16 52.85	24 35 10.7	12.7	4.8	0.35
5	23 28.0	0 26 32.67	0 50 3.3	6.7	2.5	0.17	22	1 18.4	5 18 36.45	24 25 42.6	12.9	4.9	0.36
6	23 31.0	0 33 27.44	+ 1 40 42.6	6.7	2.5	0.17	23	1 15.9	5 19 59.32	+24 14 56.8	13.2	5.0	0.36
7	23 34.1	0 40 27.31	2 32 11.9	6.7	2.5	0.17	24	1 13.1	5 21 1.47	24 2 57.4	13.5	5.1	0.37
8	23 37.2	0 47 32.44	3 24 27.8	6.6	2.5	0.17	25	1 9.9	5 21 43.06	23 49 48.8	13.8	5.2	0.38
9	23 40.4	0 54 42.96	4 17 26.0	6.6	2.5	0.17	26	1 6.2	5 22 4.38	23 35 35.4	14.1	5.3	0.39
10	23 43.7	1 1 58.97	5 11 1.9	6.6	2.5	0.17	27	1 2.2	5 22 5.85	23 20 21.8	14.4	5.4	0.39
11	23 47.1	1 9 20.55	+ 6 5 9.9	6.6	2.5	0.17	28	0 58.0	5 21 48.08	+23 4 13.3	14.6	5.5	0.40
12	23 50.7	1 16 47.69	6 59 43.7	6.6	2.5	0.17	29	0 53.5	5 21 11.87	22 47 15.7	14.9	5.6	0.41
13	23 54.3	1 24 20.36	7 54 36.1	6.6	2.5	0.17	30	0 48.7	5 20 18.21	22 29 35.4	15.1	5.7	0.41
14	23 58.0	1 31 58.44	8 49 39.4	6.6	2.5	0.17	31	0 43.6	5 19 8.28	22 11 19.2	15.3	5.8	0.42
16	0 1.8	1 39 41.72	9 44 44.5	6.6	2.5	0.17	June 1	0 38.2	5 17 43.46	21 52 34.7	15.5	5.8	0.42
17	0 5.6	1 47 29.91	+10 39 41.4	6.7	2.5	0.17	2	0 32.7	5 16 5.35	+21 33 30.4	15.7	5.9	0.42
18	0 9.5	1 55 22.59	11 34 19.7	6.7	2.5	0.17	3	0 27.0	5 14 15.75	21 14 15.1	15.8	5.9	0.43
19	0 13.5	2 3 19.23	12 28 27.8	6.7	2.5	0.17	4	0 21.1	5 12 16.62	20 54 58.7	15.9	6.0	0.43
20	0 17.5	2 11 19.17	13 21 53.5	6.8	2.6	0.17	5	0 15.0	5 10 10.01	20 35 51.5	16.0	6.0	0.43
21	0 21.6	2 19 21.63	14 14 24.1	6.8	2.6	0.18	6	0 8.9	5 7 58.14	20 17 4.2	16.0	6.1	0.43
22	0 25.7	2 27 25.71	+15 5 46.8	6.9	2.6	0.18	7	0 2.7	5 5 43.33	+19 58 47.9	16.1	6.1	0.43
23	0 29.8	2 35 30.41	15 55 48.8	7.0	2.6	0.18	7	23 56.5	5 6 27.87	19 41 13.7	16.1	6.1	0.43
24	0 34.0	2 43 34.64	16 44 17.8	7.1	2.6	0.18	8	23 50.4	5 1 14.04	19 24 32.5	16.0	6.0	0.43
25	0 38.1	2 51 37.23	17 31 2.0	7.2	2.7	0.19	9	23 44.3	4 59 4.11	19 8 54.7	15.9	6.0	0.43
26	0 42.1	2 59 36.98	18 15 50.6	7.3	2.7	0.19	10	23 38.3	4 57 0.23	18 54 30.1	15 8	6.0	0.42
27	0 46.0	3 7 32.63	+18 58 34.1	7.4	2.8	0.19	11	23 32.4	4 55 4.42	+18 41 27.3	15.6	5.9	0.42
28	0 49.9	3 15 22.97	19 39 4.3	7.5	2.8	0.20	12	23 26.7	4 53 18.57	18 29 54.2	15.5	5.9	0.41
29	0 53.7	3 23 6.81	20 17 14.4	7.7	2.9	0.20	13	23 21.2	4 51 44.43	18 19 57.6	15.3	5.8	0.40
30	0 57.4	3 30 42.99	20 52 59.5	7.8	2.9	0.21	14	23 15.9	4 50 23.51	18 11 42.6	15.1	5.7	0.40
May 1	1 0.8	3 38 10.39	21 26 15.7	7.9	3.0	0.21	15	23 10.9	4 49 17.13	18 5 13.2	14.9	5.6	0.39
2	1 4.2	3 45 27.95	+21 57 1.1	8.1	3.0	0.22	16	23 6.1	4 48 26.43	+18 0 32.0	14.7	5.5	0.39
3	1 7.3	3 52 34.72	22 25 14.8	8.2	3.1	0.22	17	23 1.6	4 47 52.38	17 57 39.8	14.4	5.4	0.38
4	1 10.3	3 59 29.84	22 50 57.3	8.4	3.2	0.23	18	22 57.4	4 47 35.76	17 56 36.5	14.1	5.3	0.37
5	1 13.1	4 6 12.49	23 14 9.8	8.6	3.2	0.23	19	22 53.5	4 47 37.21	17 57 21.1	13.8	5.2	0.37
6	1 15.7	4 12 41.88	23 34 54.5	8.8	3.3	0.24	20	22 49.9	4 47 57.22	17 59 51.1	13.5	5.1	0.36
7	1 18.0	4 18 57.28	+23 53 14.6	9.0	3.4	0.25	21	22 46.6	4 48 36.14	+18 4 3.1	13.2	5.0	0.35
8	1 20.0	4 24 58.03	24 9 13.5	9.2	3.5	0.25	22	22 43.7	4 49 34.24	18 9 52.8	12.9	4.9	0.34
9	1 21.8	4 30 43.53	24 22 54.9	9.5	3.5	0.26	23	22 41.1	4 50 51.69	18 17 15.4	12.6	4.8	0.34
10	1 23.4	4 36 13.21	24 34 23.2	9.7	3.6	0.27	24	22 38.7	4 52 28.60	18 26 5.2	12.3	4.7	0.33
11	1 24.7	4 41 26.51	24 43 42.7	9.9	3.7	0.27	25	22 36.7	4 54 25.00	18 36 15.9	12.0	4.6	0.32
12	1 25.7	4 46 22.89	+24 50 57.8	10.1	3.8	0.28	26	22 35.1	4 56 40.92	+18 47 40.7	11.7	4.5	0.31
13	1 26.4	4 51 1.84	24 56 13.1	10.4	3.9	0.29	27	22 33.7	4 59 16.35	19 0 12.5	11.4	4.3	0.31
14	1 26.8	4 55 22.86	24 59 33.1	10.7	4.0	0.29	28	22 32.7	5 2 11.24	19 13 43.8	11.2	4.2	0.30
15	1 26.9	4 59 25.48	25 1 2.3	10.9	4.1	0.30	29	22 32.0	5 5 25.55	19 28 6.8	10.9	4.1	0.29
16	1 26.7	5 3 9.28	25 0 45.1	11.2	4.2	0.31	30	22 31.6	5 8 59.23	19 43 13.0	10.7	4.0	0.29
17	1 26.2	5 6 33.86	+24 58 45.7	11.5	4.3	0.32	31	22 31.5	5 12 52.23	+19 58 53.7	10.4	3.9	0.28
18	1 25.3	5 9 38.83	+24 55 8.5	11.8	4.4	0.32	32	22 31.8	5 17 4.48	+20 15 0.0	10.1	3.8	0.27

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	22 31.5	5 12 52.23	+19 58 53.7	10.4	3.9	0.28	Aug. 17	1 11.0	10 54 9.03	+ 7 53 56.2	7.0	2.6	0.18
2	22 31.8	5 17 4.48	20 15 0.0	10.1	3.8	0.27	18	1 13.0	11 0 6.45	7 9 46.8	7.0	2.6	0.18
3	22 32.4	5 21 35.93	20 31 22.7	9.8	3.7	0.26	19	1 14.9	11 5 57.11	6 25 41.5	7.1	2.7	0.18
4	22 33.3	5 26 26.54	20 47 52.2	9.6	3.6	0.26	20	1 16.7	11 11 41.17	5 41 43.4	7.1	2.7	0.18
5	22 34.5	5 31 36.23	21 4 18.1	9.4	3.5	0.25	21	1 18.4	11 17 18.84	4 57 55.2	7.2	2.7	0.18
6	22 36.0	5 37 4.91	+21 20 30.0	9.1	3.5	0.25	22	1 19.9	11 22 50.32	+ 4 14 19.5	7.3	2.7	0.18
7	22 37.8	5 42 52.43	21 36 17.0	8.9	3.4	0.24	23	1 21.4	11 28 15.74	3 30 59.0	7.3	2.8	0.18
8	22 40.0	5 48 58.60	21 51 27.9	8.7	3.3	0.24	24	1 22.8	11 33 35.22	2 47 56.3	7.4	2.8	0.19
9	22 42.5	5 55 23.20	22 5 51.0	8.5	3.2	0.23	25	1 24.1	11 38 48.87	2 5 13.9	7.5	2.8	0.19
10	22 45.3	6 2 5.90	22 19 14.3	8.4	3.2	0.23	26	1 25.3	11 43 56.79	1 22 54.2	7.6	2.8	0.19
11	22 48.3	6 9 6.26	+22 31 25.7	8.2	3.1	0.23	27	1 26.4	11 48 59.04	+ 0 40 59.4	7.6	2.9	0.19
12	22 51 6	6 16 23.71	22 42 12.7	8.0	3.0	0.22	28	1 27.4	11 53 55.67	− 0 0 28.0	7.7	2.9	0.19
13	22 55.2	6 23 57.55	22 51 23.2	7.8	3.0	0.22	29	1 28.3	11 58 46.69	0 41 25 4	7.8	2.9	0.19
14	22 59.1	6 31 46.91	22 58 45.3	7.7	2.9	0.21	30	1 29.1	12 3 32.09	1 21 50.7	7.9	2.9	0.20
15	23 3.2	6 39 50.76	23 4 7.6	7.6	2.9	0.21	31	1 29.8	12 8 11.81	2 1 41.2	8 0	3.0	0.20
16	23 7.5	6 48 7.87	+23 7 19.3	7.5	2.8	0.20	Sept. 1	1 30.4	12 12 45.79	− 2 40 54.2	8.0	3.0	0.20
17	23 12.0	6 56 36.84	23 8 10.7	7.3	2.8	0.20	2	1 31.0	12 17 13.90	3 19 27.2	8.1	3.1	0.20
18	23 16.7	7 5 16.12	23 6 33.6	7.2	2.7	0.20	3	1 31.5	12 21 36.00	3 57 17.4	8.2	3.1	0.21
19	23 21.6	7 14 4.04	23 2 21.3	7.1	2.7	0.19	4	1 31.7	12 25 51.92	4 34 22.0	8.4	3.1	0.21
20	23 26.6	7 22 58.80	22 55 29.1	7.0	2.7	0.19	5	1 31.9	12 30 1.44	5 10 37.7	8.5	3.2	0.21
21	23 31.6	7 31 58.51	+22 45 54.2	7.0	2.6	0.19	6	1 32.0	12 34 4.28	− 5 46 1.1	8.6	3.2	0.22
22	23 36.7	7 41 1.34	22 33 35.7	6.9	2.6	0.19	7	1 32.0	12 38 0.14	6 20 28.8	8.7	3.3	0.22
23	23 41.8	7 50 5.47	22 18 34.6	6.8	2.6	0.19	8	1 31.9	12 41 48.64	6 53 56.8	8.8	3.3	0.22
24	23 46.9	7 59 9.12	22 0 54.2	6.7	2.5	0.18	9	1 31.7	12 45 29.36	7 26 21.1	9.0	3.3	0.23
25	23 52.0	8 8 10.62	21 40 39.0	6.7	2.5	0.18	10	1 31.3	12 49 1.81	7 57 37.1	9.2	3.4	0.23
26	23 57.0	8 17 8.50	+21 17 55.5	6.7	2.5	0.18	11	1 30.7	12 52 25.44	− 8 27 39.9	9.3	3.4	0.23
28	0 1.9	8 26 1.44	20 52 51.1	6.6	2.5	0.18	12	1 29.9	12 55 39.64	8 56 24.3	9.5	3.5	0.24
29	0 6.7	8 34 48.28	20 25 33.9	6.6	2.5	0.18	13	1 29.1	12 58 43.71	9 23 44.4	9.6	3.6	0.24
30	0 11.4	8 43 28.06	19 56 13.1	6.6	2.5	0.18	14	1 28.1	13 1 36.89	9 49 33.6	9.8	3.7	0.25
31	0 16.0	8 52 0.00	19 24 57.7	6.6	2.5	0.18	15	1 26.9	13 4 18.33	10 13 44.9	9.9	3.7	0 25
Aug. 1	0 20.4	9 0 23.49	+18 51 57.1	6.6	2.5	0.17	16	1 25.4	13 6 47.09	−10 36 10.4	10.1	3.8	0.26
2	0 24.7	9 8 38.06	18 17 20.9	6.5	2.5	0.17	17	1 23.7	13 9 2.17	10 56 41.5	10.3	3.9	0.26
3	0 28.9	9 16 43.42	17 41 18.1	6.5	2.5	0.17	18	1 21.8	13 11 2.46	11 15 8.8	10.5	3.9	0.27
4	0 32.8	9 24 39.39	17 3 57.6	6.6	2.5	0.17	19	1 19.6	13 12 46.77	11 31 22.1	10.7	4.0	0.27
5	0 36.7	9 32 25.86	16 25 27.7	6.6	2.5	0.17	20	1 17.1	13 14 13.84	11 45 9.8	10.9	4.1	0.28
6	0 40.4	9 40 2.83	+15 45 56.3	6.6	2.5	0.17	21	1 14.3	13 15 22.37	−11 56 19.9	11.1	4.2	0.29
7	0 43.9	9 47 30.37	15 5 31.0	6.6	2.5	0.17	22	1 11.1	13 16 11.03	12 4 39.4	11.3	4.3	0.29
8	0 47.2	9 54 48.60	14 24 18.8	6.6	2.5	0.17	23	1 7.6	13 16 38.47	12 9 54.3	11.5	4.4	0.30
9	0 50.4	10 1 57.70	13 42 26.1	6.7	2.5	0.17	24	1 3.8	13 16 43.40	12 11 50.1	11.7	4.4	0.30
10	0 53.4	10 8 57.86	12 59 59.2	6.7	2.5	0.17	25	0 59.6	13 16 24.57	12 10 11.7	12.0	4.5	0.31
11	0 56.4	10 15 49.31	+12 17 3.8	6.7	2.5	0.17	26	0 54.9	13 15 40.98	−12 4 44.6	12.3	4.6	0.31
12	0 59.2	10 22 32.30	11 33 44.9	6.8	2.5	0.17	27	0 49.8	13 14 31.92	11 55 15.3	12.5	4.7	0.32
13	1 1.8	10 29 7.08	10 50 7.3	6.8	2.6	0.17	28	0 44.3	13 12 57.00	11 41 31.6	12.7	4.8	0.32
14	1 4.2	10 35 33.90	10 6 15.7	6.8	2.6	0.17	29	0 38.4	13 10 56.33	11 23 24.7	12.9	4.8	0.33
15	1 6.6	10 41 53.00	9 22 14.1	6.9	2.6	0.18	30	0 32.1	13 8 30.64	11 0 50.1	13.0	4.9	0.33
16	1 8.9	10 48 4.63	+ 8 38 6.4	6.9	2.6	0.18	31	0 25.3	13 5 41.48	−10 33 49.2	13.1	4.9	0.33
17	1 11.0	10 54 9.03	+ 7 53 56.2	7.0	2.6	0.18	32	0 18.2	13 2 31.21	−10 2 31.3	13.3	5.0	0.34

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	0 25.3	13 5 41.48	−10 33 49.2	13.1	4.9	0.33	Nov. 15	23 22.9	15 4 33.61	−16 56 11.4	6.3	2.4	0.16
2	0 18.2	13 2 31 21	10 2 31.3	13.3	5.0	0.34	16	23 25.3	15 10 53.44	17 28 55.0	6.2	2.3	0.16
3	0 10.8	12 59 3.11	9 27 14.7	13.4	5.0	0.34	17	23 27.7	15 17 14.71	18 0 48.4	6.2	2.3	0.16
4	0 3.1	12 55 21.39	8 48 27.6	13.5	5.0	0.34	18	23 30.1	15 23 37.47	18 31 51.2	6.2	2.3	0.16
4	23 55.3	12 51 31.20	8 6 49.2	13.5	5.1	0.34	19	23 32.6	15 30 1.75	19 1 59.9	6.2	2.3	0.16
5	23 47.5	12 47 38.32	− 7 23 8.9	13.4	5.1	0.34	20	23 35.1	15 36 27.61	−19 31 13 3	6.1	2.3	0.16
6	23 39.8	12 43 49.10	6 38 24.8	13.3	5.0	0.34	21	23 37.6	15 42 55.08	19 59 29.9	6.1	2.3	0.16
7	23 32.3	12 40 10.07	5 53 40.4	13.1	5.0	0.34	22	23 40.2	15 49 24.20	20 26 48.0	6.1	2.3	0.16
8	23 25.0	12 36 47.68	5 10 1.7	13.0	4.9	0.33	23	23 42.8	15 55 55.00	20 53 6.2	6.1	2.3	0.16
9	23 18.0	12 33 47.91	4 28 34.0	12.8	4.8	0.33	24	23 45.4	16 2 27.49	21 18 22.7	6.1	2.3	0.17
10	23 11.5	12 31 16.08	− 3 50 17.3	12.5	4.7	0.32	25	23 48.0	16 9 1.71	−21 42 36.0	6.1	2.3	0.17
11	23 5.6	12 29 16.25	3 16 3.6	12.2	4.6	0.31	26	23 50.6	16 15 37.70	22 5 44.9	6.1	2.3	0.17
12	23 0.3	12 27 51.92	2 46 35.1	11.8	4.5	0.30	27	23 53.3	16 22 15.45	22 27 47.8	6.1	2.3	0.17
13	22 55.6	12 27 4.98	2 22 22.6	11.5	4.3	0.29	28	23 56.0	16 28 54.95	22 48 43.2	6.1	2.3	0.17
14	22 51.5	12 26 56.40	2 3 45.5	11.1	4.2	0.28	29	23 58.7	16 35 36.20	23 8 29.6	6.1	2.3	0.17
15	22 48.1	12 27 26.06	− 1 50 52.0	10.8	4.1	0.27	Dec. 1	0 1.5	16 42 19.21	−23 27 5.6	6.1	2.3	0.17
16	22 45.3	12 28 33.01	1 43 41.1	10.4	3.9	0.26	2	0 4.3	16 49 3.94	23 44 29.7	6.1	2.3	0.17
17	22 43.1	12 30 15.51	1 42 4.0	10.1	3.8	0.26	3	0 7.1	16 55 50.34	24 0 40.6	6.1	2.3	0.17
18	22 41.4	12 32 31.34	1 45 45.2	9.9	3.7	0.25	4	0 9.9	17 2 38.37	24 15 36.8	6.1	2.3	0.17
19	22 40.3	12 35 17.91	1 54 24.4	9.6	3.6	0.24	5	0 12.8	17 9 27.97	24 29 16.9	6.1	2.3	0.17
20	22 39.6	12 38 32.41	− 2 7 38.2	9.3	3.5	0.24	6	0 15.7	17 16 19.07	−24 41 39.5	6.2	2.3	0.17
21	22 39.3	12 42 12.00	2 25 1.2	9.0	3.4	0.23	7	0 18.6	17 23 11.56	24 52 43.1	6.2	2.3	0.17
22	22 39.3	12 46 13.82	2 46 7.6	8.7	3.3	0.22	8	0 21.6	17 30 5.35	25 2 26.3	6.2	2.3	0.17
23	22 39.7	12 50 35.15	3 10 31.5	8.5	3.2	0.22	9	0 24.5	17 37 0.33	25 10 47.8	6.2	2.3	0.17
24	22 40.5	12 55 13.50	3 37 47.6	8.3	3.2	0.21	10	0 27.5	17 43 56.35	25 17 46.1	6.3	2.4	0.18
25	22 41.5	13 0 6.52	− 4 7 32.1	8.1	3.1	0.21	11	0 30.5	17 50 53.23	−25 23 20.0	6.3	2.4	0.18
26	22 42.6	13 5 12.13	4 39 22.7	7.9	3.0	0.20	12	0 33.5	17 57 50.79	25 27 28.1	6.4	2.4	0.18
27	22 43.9	13 10 28.49	5 12 58.9	7.8	2.9	0.20	13	0 36.5	18 4 48.83	25 30 9.2	6.4	2.4	0.18
28	22 45.4	13 15 53.95	5 48 2.0	7.6	2.9	0.19	14	0 39.5	18 11 47.11	25 31 22.3	6.5	2.4	0.18
29	22 47.0	13 21 27.11	6 24 15.1	7.5	2.8	0.19	15	0 42.5	18 18 45.37	25 31 6.4	6.5	2.5	0.18
30	22 48.7	13 27 6.78	− 7 1 23.2	7.3	2.8	0.19	16	0 45.6	18 25 43.31	−25 29 20.5	6.6	2.5	0.18
31	22 50.5	13 32 51.95	7 39 13 0	7.2	2.7	0.18	17	0 48.6	18 32 40.58	25 26 3.2	6.6	2.5	0.18
Nov. 1	22 52.4	13 38 41.78	8 17 32.3	7.1	2.7	0.18	18	0 51.6	18 39 36.80	25 21 14.3	6.7	2 5	0.19
2	22 54.3	13 44 35.53	8 56 10.4	7.0	2.6	0.18	19	0 54.5	18 46 31.56	25 14 53.2	6.8	2.5	0.19
3	22 56.3	13 50 32.60	9 34 58.4	6.9	2.6	0.18	20	0 57.5	18 53 24.39	25 6 59.7	6.8	2.6	0.19
4	22 58.3	13 56 32.54	−10 13 47.8	6.9	2.6	0.18	21	1 0.4	19 0 14.72	−24 57 33.9	6.9	2.6	0.19
5	23 0.4	14 2 34.97	10 52 31.3	6.8	2.5	0.17	22	1 3.2	19 7 1.95	24 46 35.8	7.0	2.6	0.19
6	23 2.6	14 8 39.57	11 31 2.8	6.7	2.5	0.17	23	1 6.0	19 13 45.40	24 34 6.1	7.1	2.7	0.20
7	23 4.8	14 14 46.08	12 9 16.5	6.6	2.5	0.17	24	1 8.7	19 20 24.29	24 20 5.9	7.2	2.7	0.20
8	23 7.0	14 20 54.32	12 47 7.4	6.6	2.5	0.17	25	1 11.3	19 26 57.76	24 4 36.8	7.3	2.7	0.20
9	23 9.2	14 27 4.18	−13 24 31.3	6.5	2.4	0.17	26	1 13.8	19 33 24.81	−23 47 41.1	7.4	2.8	0.20
10	23 11.4	14 33 15.56	14 1 24.1	6.4	2.4	0.17	27	1 16.2	19 39 44.33	23 29 21.7	7.5	2.8	0.21
11	23 13.7	14 39 28.39	14 37 42.4	6.4	2.4	0.17	28	1 18.4	19 45 55.05	23 9 42.4	7.7	2.9	0.21
12	23 16.0	14 45 42.61	15 13 23.1	6.4	2.4	0.17	29	1 20.4	19 51 55.55	22 48 47.8	7.8	2.9	0.21
13	23 18.3	14 51 58.22	15 48 23.1	6 3	2.4	0.17	30	1 22.3	19 57 44.24	22 26 43.8	8.0	3.0	0.21
14	23 20.6	14 58 15.21	−16 22 40.0	6.3	2.4	0.16	31	1 24.0	20 3 19.28	−22 3 37.7	8.1	3.1	0.22
15	23 22.9	15 4 33.61	−16 56 11.4	6.3	2.4	0.16	32	1 25.4	20 8 38.65	−21 39 38.0	8.3	3.1	0.22

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	21 42.1	16 25 49.78	−17 4 27.2	25.2	24.3	1.70	Feb. 15	21 1.2	18 46 7.08	−19 46 21.7	13.0	12.6	0.89
1	21 39.2	16 26 49.71	17 2 31.2	24.9	24.0	1.68	16	21 1.6	18 50 26.15	19 46 5.2	12.9	12.4	0.88
2	21 36.5	16 27 58.03	17 1 19.7	24.5	23.6	1.65	17	21 2.0	18 54 46.77	19 45 22.3	12.8	12.3	0.87
3	21 33.8	16 29 14.47	17 0 50.5	24.1	23.2	1.62	18	21 2.4	18 59 8.85	19 44 12.4	12.6	12.2	0.86
4	21 31.2	16 30 38.79	17 1 1.2	23.7	22.8	1.59	19	21 2.9	19 3 32.32	19 42 35.0	12.4	12.0	0.85
5	21 28.8	16 32 10.74	−17 1 49.6	23.2	22.4	1.57	20	21 3.3	19 7 57.10	−19 40 29.6	12.3	11.9	0.84
6	21 26.5	16 33 50.06	17 3 13.3	22.9	22.1	1.54	21	21 3.8	19 12 23.11	19 37 55.8	12.2	11.8	0.83
7	21 24.4	16 35 36.53	17 5 10.1	22.5	21.7	1.52	22	21 4.3	19 16 50.27	19 34 53.2	12.0	11.7	0.82
8	21 22.4	16 37 29.90	17 7 37.6	22.2	21.4	1.49	23	21 4.8	19 21 18.53	19 31 21.5	11.9	11.5	0.82
9	21 20.5	16 39 29.93	17 10 33.6	21.8	21.0	1.47	24	21 5.3	19 25 47.81	19 27 20.4	11.8	11.4	0.81
10	21 18.7	16 41 36.41	−17 13 55.7	21.4	20.7	1.44	25	21 5.9	19 30 18.04	−19 22 49.6	11.7	11.3	0.80
11	21 17.0	16 43 49.12	17 17 41.8	21.0	20.3	1.42	26	21 6.5	19 34 49.16	19 17 48.8	11.6	11.2	0.79
12	21 15.3	16 46 7.84	17 21 49.5	20.7	20.0	1.40	27	21 7.1	19 39 21.07	19 12 17.9	11.5	11.1	0.78
13	21 13.7	16 48 32.38	17 26 16.7	20.4	19.7	1.38	28	21 7.7	19 43 53.71	19 6 16.8	11.3	11.0	0.77
14	21 12.2	16 51 2.56	17 31 1.3	20.1	19.4	1.36	Mar. 1	21 8.3	19 48 26.99	18 59 45.4	11.2	10.8	0.76
15	21 10.9	16 53 38.20	−17 36 1.3	19.7	19.1	1.34	2	21 8.9	19 53 0.86	−18 52 43.5	11.1	10.7	0.76
16	21 9.7	16 56 19.10	17 41 14.6	19.4	18.8	1.32	3	21 9.6	19 57 35.26	18 45 11.0	11.0	10.6	0.75
17	21 8.5	16 59 5.11	17 46 39.2	19.2	18.5	1.30	4	21 10.2	20 2 10.11	18 37 8.0	10.9	10.5	0.74
18	21 7.4	17 1 56.07	17 52 13.2	18.9	18.2	1.28	5	21 10.9	20 6 45.34	18 28 34.4	10.8	10.4	0.73
19	21 6.4	17 4 51.81	17 57 54.7	18.6	17.9	1.26	6	21 11.5	20 11 20.90	18 19 30.4	10.7	10.3	0.73
20	21 5.4	17 7 52.18	−18 3 41.8	18.3	17.7	1.24	7	21 12.2	20 15 56.73	−18 9 56.2	10.6	10.2	0.72
21	21 4.5	17 10 57.05	18 9 32.8	18.0	17.4	1.22	8	21 12.8	20 20 32.77	17 59 51.7	10.5	10.2	0.71
22	21 3.7	17 14 6.27	18 15 26.0	17.8	17.2	1.20	9	21 13.5	20 25 8.97	17 49 17.0	10.4	10.1	0.70
23	21 3.0	17 17 19.70	18 21 19.7	17.5	16.9	1.18	10	21 14.1	20 29 45.28	17 38 12.4	10.3	10 0	0.70
24	21 2.4	17 20 37.21	18 27 12.1	17.2	16.7	1.17	11	21 14.8	20 34 21.65	17 26 38.0	10.2	9.9	0.69
25	21 1.8	17 23 58.67	−18 33 1.7	17.0	16.4	1.16	12	21 15.4	20 38 58.03	−17 14 34.0	10.1	9.8	0.68
26	21 1.3	17 27 23.93	18 38 47.0	16.8	16.2	1.14	13	21 16.1	20 43 34.36	17 2 0.6	10.1	9.7	0.68
27	21 0.8	17 30 52.88	18 44 26.5	16.5	16.0	1.12	14	21 16.7	20 48 10.62	16 48 58.1	10.0	9.6	0.67
28	21 0.4	17 34 25.39	18 49 58.6	16.3	15.8	1.11	15	21 17.4	20 52 46.77	16 35 26.7	9.9	9.6	0.66
29	21 0.1	17 38 1.32	18 55 22.1	16.1	15.5	1.10	16	21 18.0	20 57 22.78	16 21 26.7	9.8	9.5	0.66
30	20 59.9	17 41 40.57	−19 0 35.6	15.8	15.3	1.08	17	21 18.7	21 1 58.61	−16 6 58.5	9.7	9.4	0.65
31	20 59.7	17 45 22.99	19 5 37.7	15.6	15.1	1.07	18	21 19.3	21 6 34.24	15 52 2.3	9.6	9.3	0.65
Feb. 1	20 59.5	17 49 8.48	19 10 27.3	15.4	14.9	1.05	19	21 20.0	21 11 9.64	15 36 38.5	9.5	9.2	0.64
2	20 59.4	17 52 56.91	19 15 3.2	15.2	14.7	1.04	20	21 20.6	21 15 44.78	15 20 47.4	9.5	9.2	0.64
3	20 59.3	17 56 48.18	19 19 24.2	15.0	14.5	1.03	21	21 21.3	21 20 19.65	15 4 29.4	9.4	9.1	0.03
4	20 59.2	18 0 42.18	−19 23 29.3	14.8	14.4	1.02	22	21 21.9	21 24 54.22	−14 47 44.9	9.3	9.0	0.62
5	20 59.2	18 4 38.79	19 27 17.4	14.7	14.2	1.00	23	21 22.6	21 29 28.47	14 30 34.4	9.3	9.0	0.62
6	20 59.2	18 8 37.91	19 30 47.5	14.5	14.0	0.99	24	21 23.2	21 34 2.39	14 12 58.3	9.2	8.9	0.61
7	20 59.3	18 12 39.44	19 33 58.6	14.3	13.8	0.98	25	21 23.8	21 38 35.96	13 54 56.9	9.2	8.8	0.61
8	20 59.4	18 16 43.28	19 36 49.8	14.1	13.7	0.97	26	21 24.4	21 43 9.17	13 36 30.7	9.1	8.7	0.60
9	20 59.6	18 20 49.33	−19 39 20.1	13.9	13.5	0.96	27	21 25.0	21 47 42.00	−13 17 40.3	9.0	8.7	0.60
10	20 59.8	18 24 57.50	19 41 28.9	13.8	13.3	0.94	28	21 25.6	21 52 14.44	12 58 26.2	8.9	8.6	0.59
11	21 0.0	18 29 7.71	19 43 15.2	13.6	13.2	0.93	29	21 26.2	21 56 46.47	12 38 48.8	8.9	8.5	0.59
12	21 0.3	18 33 19.86	19 44 38.3	13.5	13.0	0.92	30	21 26.8	22 1 18.09	12 18 48.7	8.8	8.5	0.58
13	21 0.6	18 37 33.85	19 45 37.6	13.3	12.9	0.91	31	21 27.4	22 5 40.29	11 58 26.6	8.7	8.4	0.58
14	21 0.9	18 41 49.62	−19 46 12.3	13.2	12.7	0.90	32	21 28.0	22 10 20.06	−11 37 42.9	8.7	8.4	0.57
15	21 1.2	18 46 7.08	−19 46 21.7	13.0	12.6	0.89	33	21 28.5	22 14 50.40	−11 16 38.1	8.6	8.3	0.57

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	21 28.0	22 10 20.06	−11 37 42.9	8.7	8.4	0.57	May 17	21 50.0	1 33 51.27	+ 7 50 14.1	6.7	6.5	0.43
2	21 28.5	22 14 50.40	11 16 38.1	8.6	8.3	0.57	18	21 50.6	1 38 20.66	8 16 18.0	6.6	6.4	0.43
3	21 29.1	22 19 20.31	10 55 12.8	8.5	8.2	0.56	19	21 51.1	1 42 50.71	8 42 13.1	6.6	6.4	0.43
4	21 29.6	22 23 49.77	10 33 27.8	8.4	8.2	0.56	20	21 51.7	1 47 21.44	9 7 58.7	6.6	6.4	0.43
5	21 30.2	22 28 18.79	10 11 23.5	8.4	8.1	0.55	21	21 52.3	1 51 52.89	9 33 34.2	6.5	6.3	0.43
6	21 30.7	22 32 47.38	− 9 49 0.5	8.3	8.1	0.55	22	21 52.9	1 56 25.10	+ 9 58 58.9	6.5	6.3	0.43
7	21 31.2	22 37 15.54	9 26 19.4	8.3	8.0	0.54	23	21 53.5	2 0 58.08	10 24 12.0	6.5	6.3	0.42
8	21 31.7	22 41 43.26	9 3 20.9	8.2	8.0	0.54	24	21 54.1	2 5 31.87	10 49 12.9	6.4	6.2	0.42
9	21 32.2	22 46 10.56	8 40 5.4	8.2	7.9	0.53	25	21 54.7	2 10 6.50	11 14 0.9	6.4	6.2	0.42
10	21 32.7	22 50 37.45	8 16 33.6	8.1	7.9	0.53	26	21 55.4	2 14 41.98	11 38 35.3	6.4	6.2	0.42
11	21 33.2	22 55 3.95	− 7 52 46.2	8.0	7.8	0.53	27	21 56.0	2 19 18.35	+12 2 55.4	6.4	6.2	0.42
12	21 33.7	22 59 30.07	7 28 43.7	8.0	7.8	0.52	28	21 56.7	2 23 55.65	12 27 0.4	6.3	6.1	0.42
13	21 34.2	23 3 55.82	7 4 26.7	7.9	7.7	0.52	29	21 57.4	2 28 33.89	12 50 49.7	6.3	6.1	0.42
14	21 34.7	23 8 21.22	6 39 55.9	7.9	7.7	0.52	30	21 58.2	2 33 13.08	13 14 22.6	6.3	6.1	0.42
15	21 35.2	23 12 46.28	6 15 11.8	7.9	7.6	0.51	31	21 58.9	2 37 53.25	13 37 38.3	6.3	6.1	0.42
16	21 35.7	23 17 11.04	− 5 50 15.0	7.8	7.6	0.51	June 1	21 59.7	2 42 34.42	+14 0 36.2	6.3	6.0	0.41
17	21 36.2	23 21 35.52	5 25 6.1	7.8	7.5	0.50	2	22 0.4	2 47 16.60	14 23 15.6	6.2	6.0	0.41
18	21 36.6	23 25 59.74	4 59 45.7	7.7	7.5	0.50	3	22 1.2	2 51 59.80	14 45 35.7	6.2	6.0	0.41
19	21 37.1	23 30 23.72	4 34 14.5	7.7	7.4	0.50	4	22 2.0	2 56 44.04	15 7 35.8	6.2	6.0	0.41
20	21 37.5	23 34 47.50	4 8 33.1	7.6	7.4	0.49	5	22 2.8	3 1 29.33	15 29 15.2	6.2	5.9	0.41
21	21 38.0	23 39 11.10	− 3 42 42.0	7.6	7.4	0.49	6	22 3.6	3 6 15.69	+15 50 33.2	6.1	5.9	0.41
22	21 38.4	23 43 34.53	3 16 42.0	7.5	7.3	0.49	7	22 4.5	3 11 3.13	16 11 29.1	6.1	5.9	0.41
23	21 38.9	23 47 57.83	2 50 33.6	7.5	7.3	0.48	8	22 5.3	3 15 51.65	16 32 2.1	6.1	5.9	0.41
24	21 39.3	23 52 21.03	2 24 17.5	7.4	7.2	0.48	9	22 6.2	3 20 41.26	16 52 11.6	6.1	5.9	0.41
25	21 39.7	23 56 44.17	1 57 54.3	7.4	7.2	0.48	10	22 7.1	3 25 31.97	17 11 56.8	6.0	5.8	0.41
26	21 40.1	0 1 7.25	− 1 31 24.7	7.4	7.1	0.48	11	22 8.0	3 30 23.78	+17 31 17.3	6.0	5.8	0.41
27	21 40.5	0 5 30.31	1 4 49.2	7.3	7.1	0.47	12	22 8.9	3 35 16.71	17 50 12.3	6.0	5.8	0.41
28	21 41.0	0 9 53.39	0 38 8.6	7.3	7.1	0.47	13	22 9.9	3 40 10.75	18 8 41.1	6.0	5.8	0.41
29	21 41.4	0 14 16.50	− 0 11 23.5	7.2	7.0	0.47	14	22 10.9	3 45 5.90	18 26 43.0	6.0	5.8	0.40
30	21 41.9	0 18 39.67	+ 0 15 25.3	7.2	7.0	0.47	15	22 11.9	3 50 2.18	18 44 17.4	5.9	5.7	0.40
May 1	21 42.3	0 23 2.93	+ 0 42 17.2	7.1	7.0	0.46	16	22 12.9	3 54 59.57	+19 1 23.6	5.9	5.7	0.40
2	21 42.8	0 27 26.31	1 9 11.7	7.1	6.9	0.46	17	22 13.9	3 59 58.07	19 18 0.8	5.9	5.7	0.40
3	21 43.2	0 31 49.84	1 36 8.0	7.1	6.9	0.46	18	22 14.9	4 4 57.67	19 34 8.6	5.9	5.7	0.40
4	21 43.7	0 36 13.54	2 3 5.5	7.0	6.8	0.46	19	22 16.0	4 9 58.37	19 49 46.2	5.9	5.7	0.40
5	21 44.1	0 40 37.44	2 30 3.4	7.0	6.8	0.45	20	22 17.1	4 15 0.17	20 4 53.1	5.8	5.6	0.40
6	21 44.6	0 45 1.57	+ 2 57 1.0	7.0	6.8	0.45	21	22 18.2	4 20 3.04	+20 19 28.5	5.8	5.6	0.40
7	21 45.0	0 49 25.97	3 23 57.9	6.9	6.7	0.45	22	22 19.3	4 25 6.96	20 33 32.0	5.8	5.6	0.40
8	21 45.5	0 53 50.67	3 50 53.2	6.9	6.7	0.45	23	22 20.5	4 30 11.92	20 47 2.9	5.8	5.6	0.40
9	21 46.0	0 58 15.69	4 17 46.3	6.9	6.7	0.45	24	22 21.7	4 35 17.90	21 0 0.7	5.8	5.6	0.40
10	21 46.5	1 2 41.05	4 44 36.7	6.9	6.6	0.44	25	22 22.9	4 40 24.88	21 12 24.8	5.8	5.6	0.40
11	21 47.0	1 7 6.80	+ 5 11 23.5	6.8	6.6	0.44	26	22 24.0	4 45 32.83	+21 24 14.7	5.7	5.6	0.40
12	21 47.5	1 11 32.97	5 38 6.2	6.8	6.6	0.44	27	22 25.2	4 50 41.72	21 35 29.7	5.7	5.5	0.40
13	21 48.0	1 15 59.59	6 4 44.1	6.8	6.6	0.44	28	22 26.4	4 55 51.52	21 46 9.4	5.7	5.5	0.40
14	21 48.5	1 20 26.69	6 31 16.4	6.7	6.5	0.44	29	22 27.6	5 1 2.19	21 56 13.3	5.7	5.5	0.39
15	21 49.0	1 24 54.32	6 57 42.7	6.7	6.5	0.43	30	22 28.8	5 6 13.70	22 5 40.9	5.7	5.5	0.39
16	21 49.5	1 29 22.50	+ 7 24 2.1	6.7	6.5	0.43	31	22 30.1	5 11 26.01	+22 14 31.8	5.7	5.5	0.39
17	21 50.0	1 33 51.27	+ 7 50 14.1	6.7	6.5	0.43	32	22 31.4	5 16 39.08	+22 22 45.5	5.7	5.5	0.39

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	22 30.1	5 11 26.01	+22 14 31.8	5.7	5.5	0.39	Aug. 16	23 28.6	9 11 30.45	+17 18 38.4	5.2	5.0	0.35
2	22 31.4	5 16 39.08	22 22 45.5	5.7	5.5	0.39	17	23 29.6	9 16 28.45	16 58 4.8	5.2	5.0	0.35
3	22 32.7	5 21 52.87	22 30 21.6	5.6	5.4	0.39	18	23 30.6	9 21 25.42	16 37 2.5	5.2	5.0	0.35
4	22 34.0	5 27 7.33	22 37 19.6	5.6	5.4	0.39	19	23 31.6	9 26 21.35	16 15 32.2	5.2	5.0	0.35
5	22 35.3	5 32 22.42	22 43 39.3	5.6	5.4	0.39	20	23 32.6	9 31 16.27	15 53 34.5	5.2	5.0	0.35
6	22 36.6	5 37 38.09	+22 49 20.3	5.6	5.4	0.39	21	23 33.6	9 36 10.18	+15 31 10.1	5.2	5.0	0.35
7	22 37.9	5 42 54.28	22 54 22.2	5.6	5.4	0.39	22	23 34.5	9 41 3.08	15 8 19.6	5.2	5.0	0.35
8	22 39.2	5 48 10.95	22 58 44.9	5.6	5.4	0.39	23	23 35.4	9 45 55.00	14 45 3.8	5.2	5.0	0.35
9	22 40.6	5 53 28.06	23 2 28.0	5.6	5.4	0.39	24	23 36.3	9 50 45.93	14 21 23.4	5.2	5.0	0.34
10	22 41.9	5 58 45.54	23 5 31.3	5.5	5.3	0.39	25	23 37.2	9 55 35.89	13 57 19.1	5.2	5.0	0.34
11	22 43.3	6 4 3.36	+23 7 54.5	5.5	5.3	0.39	26	23 38.1	10 0 24.91	+13 32 51.6	5.2	5.0	0.34
12	22 44.6	6 9 21.45	23 9 37.7	5.5	5.3	0.39	27	23 39.0	10 5 12.99	13 8 1.5	5.2	5.0	0.34
13	22 46.0	6 14 39.76	23 10 40.7	5.5	5.3	0.39	28	23 39.8	10 10 0.15	12 42 49.7	5.2	5.0	0.34
14	22 47.3	6 19 58.24	23 11 3.1	5.5	5.3	0.38	29	23 40.7	10 14 46.41	12 17 16.7	5.2	5.0	0.34
15	22 48.7	6 25 16.85	23 10 45.0	5.5	5.3	0.38	30	23 41.5	10 19 31.79	11 51 23.4	5.2	5.0	0.34
16	22 50.0	6 30 35.52	+23 9 46.2	5.5	5.3	0.38	31	23 42.3	10 24 16.31	+11 25 10.4	5.2	5.0	0.34
17	22 51.4	6 35 54.21	23 8 6.5	5.4	5.3	0.38	Sept. 1	23 43.1	10 28 59.97	10 58 38.6	5.2	5.0	0.34
18	22 52.8	6 41 12.86	23 5 46.1	5.4	5.3	0.38	2	23 43.9	10 33 42.81	10 31 48.6	5.2	5.0	0.34
19	22 54.2	6 46 31.43	23 2 45.1	5.4	5.2	0.38	3	23 44.6	10 38 24.86	10 4 41.3	5.1	5.0	0.34
20	22 55.6	6 51 49.87	22 59 3.4	5.4	5.2	0.38	4	23 45.3	10 43 6.16	9 37 17.2	5.1	5.0	0.34
21	22 56.9	6 57 8.11	+22 54 41.2	5.4	5.2	0.38	5	23 46.0	10 47 46.71	+ 9 9 37.1	5.1	5.0	0.34
22	22 58.3	7 2 26.11	22 49 38.5	5.4	5.2	0.38	6	23 46.7	10 52 26.56	8 41 41.8	5.1	5.0	0.34
23	22 59.6	7 7 43.81	22 43 55.5	5.4	5.2	0.38	7	23 47.4	10 57 5.74	8 13 32.0	5.1	5.0	0.34
24	23 1.0	7 13 1.17	22 37 32.4	5.4	5.2	0.38	8	23 48.1	11 1 44.28	7 45 8.4	5.1	5.0	0.33
25	23 2.3	7 18 18.14	22 30 29.3	5.4	5.2	0.37	9	23 48.8	11 6 22.21	7 16 31.8	5.1	5.0	0.33
26	23 3.6	7 23 34.67	+22 22 46.4	5.4	5.2	0.37	10	23 49.5	11 10 59.57	+ 6 47 42.8	5.1	5.0	0.33
27	23 4.9	7 28 50.72	22 14 24.0	5.4	5.2	0.37	11	23 50.2	11 15 36.38	6 18 42.2	5.1	5.0	0.33
28	23 6.2	7 34 6.24	22 5 22.3	5.3	5.2	0.37	12	23 50.9	11 20 12.70	5 49 30.8	5.1	5.0	0.33
29	23 7.5	7 39 21.18	21 55 41.6	5.3	5.2	0.37	13	23 51.5	11 24 48.55	5 20 9.1	5.1	5.0	0.33
30	23 8.8	7 44 35.49	21 45 22.4	5.3	5.1	0.37	14	23 52.2	11 29 23.98	4 50 38.1	5.1	5.0	0 33
31	23 10.1	7 49 49.14	+21 34 25.0	5.3	5.1	0.37	15	23 52.8	11 33 59.03	+ 4 20 58.3	5.1	5.0	0.33
Aug. 1	23 11.4	7 55 2.08	21 22 49.8	5.3	5.1	0.37	16	23 53.4	11 38 33.74	3 51 10.6	5.1	5.0	0.33
2	23 12.6	8 0 14.26	21 10 37.1	5.3	5.1	0.37	17	23 54.0	11 43 8.13	3 21 15.6	5.1	5.0	0.33
3	23 13.8	8 5 25.67	20 57 47.3	5.3	5.1	0.37	18	23 54.6	11 47 42.26	2 51 14.0	5.1	5.0	0.33
4	23 15.0	8 10 36.26	20 44 20.9	5.3	5.1	0.36	19	23 55.3	11 52 16.18	2 21 6.7	5.1	5.0	0.33
5	23 16.2	8 15 46.00	+20 30 18.4	5.3	5.1	0.36	20	23 55.9	11 56 49.92	+ 1 50 54.3	5.1	5.0	0.33
6	23 17.4	8 20 54.86	20 15 40.3	5.3	5.1	0.36	21	23 56.5	12 1 23.53	1 20 37.4	5.1	5.0	0.33
7	23 18.6	8 26 2.82	20 0 27.1	5.3	5.1	0.36	22	23 57.1	12 5 57.05	0 50 17.0	5.1	5.0	0.33
8	23 19.8	8 31 9.85	19 44 39.3	5.3	5.1	0.36	23	23 57.8	12 10 30.52	+ 0 19 53.7	5.1	5.0	0.33
9	23 21.0	8 36 15.91	19 28 17.4	5.3	5.1	0.36	24	23 58.4	12 15 3.99	− 0 10 31.8	5.1	5.0	0.33
10	23 22.1	8 41 21.00	+19 11 22.0	5.2	5.1	0.36	25	23 59.0	12 19 37.49	− 0 40 58.6	5.1	5.0	0.33
11	23 23.2	8 46 25.10	18 53 53.7	5.2	5.1	0.36	26	23 59.6	12 24 11.06	1 11 26.1	5.1	5.0	0.33
12	23 24.3	8 51 28.20	18 35 53.0	5.2	5.1	0.36	28	0 0.2	12 28 44.76	1 41 53.5	5.1	5.0	0.33
13	23 25.4	8 56 30.29	18 17 20.5	5.2	5.1	0.36	29	0 0.8	12 33 18.62	2 12 20.1	5.1	5.0	0.33
14	23 26.5	9 1 31.37	17 58 16.8	5.2	5.0	0.35	30	0 1.4	12 37 52.68	2 42 45.1	5.1	5.0	0.33
15	23 27.6	9 6 31.43	+17 38 42.6	5.2	5.0	0.35	31	0 2.0	12 42 26.98	− 3 13 7.7	5.1	5.0	0.33
16	23 28.6	9 11 30.45	+17 18 38.4	5.2	5.0	0.35	32	0 2.7	12 47 1.55	− 3 43 27.2	5.1	5.0	0.33

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	0 2.0	12 42 26.98	− 3 13 7.7	5.1	5.0	0.33	Nov. 16	0 45.2	16 27 5.43	−22 4 24.6	5.4	5.2	0.37
2	0 2.7	12 47 1.55	3 43 27.2	5.1	5.0	0.33	17	0 46.6	16 32 24.47	22 18 19.1	5.4	5.2	0.38
3	0 3.3	12 51 36.44	4 13 42.8	5.1	5.0	0.33	18	0 48.0	16 37 44.54	22 31 34.6	5.4	5.2	0.38
4	0 4.0	12 56 11.69	4 43 53.9	5.1	5.0	0.33	19	0 49.4	16 43 5.63	22 44 10.5	5.4	5.2	0.38
5	0 4.6	13 0 47.34	5 13 59.6	5.1	5.0	0.33	20	0 50.8	16 48 27.69	22 56 6.2	5.4	5.2	0.38
6	0 5.3	13 5 23.43	− 5 43 59.0	5.2	5.0	0.33	21	0 52.3	16 53 50.66	−23 7 21.2	5.4	5.3	0.38
7	0 5.9	13 10 0.01	6 13 51.5	5.2	5.0	0.33	22	0 53.7	16 59 14.51	23 17 54.9	5.4	5.3	0.38
8	0 6.6	13 14 37.11	6 43 36.3	5.2	5.0	0.33	23	0 55.2	17 4 39.19	23 27 46.9	5.5	5.3	0.38
9	0 7.3	13 19 14.76	7 13 12.6	5.2	5.0	0.34	24	0 56.6	17 10 4.64	23 36 56.6	5.5	5.3	0.38
10	0 8.0	13 23 53.01	7 42 39.8	5.2	5.0	0.34	25	0 58.1	17 15 30.83	23 45 23.6	5.5	5.3	0.39
11	0 8.7	13 28 31.89	− 8 11 57.0	5.2	5.0	0.34	26	0 59.6	17 20 57.69	−23 53 7.6	5.5	5.3	0.39
12	0 9.4	13 33 11.46	8 41 3.3	5.2	5.0	0.34	27	1 1.1	17 26 25.17	24 0 8.2	5.5	5.3	0.39
13	0 10.1	13 37 51.74	9 9 58.1	5.2	5.0	0.34	28	1 2.6	17 31 53.20	24 6 25.0	5.5	5.3	0.39
14	0 10.8	13 42 32.78	9 38 40.6	5.2	5.0	0.34	29	1 4.2	17 37 21.73	24 11 57.8	5.5	5.3	0.39
15	0 11.6	13 47 14.61	10 7 10.0	5.2	5.0	0.34	30	1 5.7	17 42 50.68	24 16 46.1	5.5	5.3	0.39
16	0 12.4	13 51 57.28	−10 35 25.6	5 2	5.0	0.34	Dec. 1	1 7.3	17 48 20.00	−24 20 49.9	5.5	5.4	0.39
17	0 13.2	13 56 40.82	11 3 26.4	5.2	5.0	0.34	2	1 8.8	17 53 49.60	24 24 8.9	5.6	5.4	0.39
18	0 14.0	14 1 25.26	11 31 11.7	5.2	5.0	0.34	3	1 10.4	17 59 19.44	24 26 42.8	5.6	5.4	0.39
19	0 14.8	14 6 10.63	11 58 40.8	5.2	5.0	0.34	4	1 11.9	18 4 49.43	24 28 31.5	5.6	5.4	0.39
20	0 15.7	14 10 56.97	12 25 53.0	5.2	5.0	0.34	5	1 13.5	18 10 19.51	24 29 35.0	5.6	5.4	0.39
21	0 16.5	14 15 44.32	−12 52 47.3	5.2	5.0	0.34	6	1 15.0	18 15 49.59	−24 29 53.2	5.6	5.4	0.39
22	0 17.4	14 20 32.71	13 19 23.1	5.2	5.0	0.35	7	1 16.6	18 21 19.63	24 29 26.0	5.6	5.4	0.40
23	0 18.3	14 25 22.16	13 45 39.4	5.2	5.0	0.35	8	1 18.1	18 26 49.54	24 28 13.4	5.6	5.4	0.40
24	0 19.2	14 30 12.69	14 11 35.4	5.2	5.0	0.35	9	1 19.7	18 32 19.26	24 26 15.5	5.6	5.4	0.40
25	0 20.1	14 35 4.34	14 37 10.3	5.2	5.1	0.35	10	1 21.2	18 37 48.73	24 23 32.3	5.6	5.4	0.40
26	0 21.0	14 39 57.13	−15 2 23.4	5.2	5.1	0.35	11	1 22.8	18 43 17.87	−24 20 4.0	5.6	5.5	0.40
27	0 21.9	14 44 51.08	15 27 14.0	5.3	5.1	0.35	12	1 24.3	18 48 46.62	24 15 50.7	5.7	5.5	0.40
28	0 22.9	14 49 46.22	15 51 41.2	5.3	5.1	0.35	13	1 25.9	18 54 14.91	24 10 52.5	5.7	5.5	0.40
29	0 23.9	14 54 42.56	16 15 44.2	5.3	5.1	0.35	14	1 27.4	18 59 42.67	24 5 9.6	5.7	5.5	0.40
30	0 24.9	14 59 40.10	16 39 22.0	5.3	5.1	0.35	15	1 28.9	19 5 9.85	23 58 42.4	5.7	5.5	0.40
31	0 25.9	15 4 38.86	−17 2 33.8	5.3	5.1	0.36	16	1 30.4	19 10 36.41	−23 51 31.2	5.7	5.5	0.40
Nov. 1	0 27.0	15 9 38.85	17 25 18.9	5.3	5.1	0.36	17	1 31.9	19 16 2.28	23 43 36.2	5.7	5.5	0.40
2	0 28.1	15 14 40.07	17 47 36.5	5.3	5.1	0.36	18	1 33.4	19 21 27.40	23 34 57.7	5.7	5.6	0.40
3	0 29.2	15 19 42.54	18 9 25.9	5.3	5.1	0.36	19	1 34.8	19 26 51.71	23 25 36.1	5.8	5.6	0.40
4	0 30.3	15 24 46.24	18 30 46.2	5.3	5.1	0.36	20	1 36.2	19 32 15.16	23 15 31.8	5.8	5.6	0.40
5	0 31.4	15 29 51.18	−18 51 36.6	5.3	5.1	0.36	21	1 37.6	19 37 37.71	−23 4 45.3	5.8	5.6	0.40
6	0 32.6	15 34 57.36	19 11 56.3	5.3	5.1	0.36	22	1 39.0	19 42 59.30	22 53 17.0	5.8	5.6	0.41
7	0 33.8	15 40 4.78	19 31 44.7	5.3	5.1	0.36	23	1 40.4	19 48 19.90	22 41 7.4	5.8	5.6	0.41
8	0 35.0	15 45 13.43	19 51 0.9	5.3	5.1	0.37	24	1 41.8	19 53 39.46	22 28 17.0	5.8	5.6	0.41
9	0 36.2	15 50 23.30	20 9 44.1	5.3	5.2	0.37	25	1 43.2	19 58 57.93	22 14 46.4	5.8	5.7	0.41
10	0 37.4	15 55 34.39	−20 27 53.6	5.3	5.2	0.37	26	1 44.6	20 4 15.27	−22 0 36.1	5.9	5.7	0.41
11	0 38.7	16 0 46.68	20 45 28.8	5.4	5.2	0.37	27	1 45.9	20 9 31.45	21 45 46.8	5.9	5.7	0.41
12	0 40.0	16 6 0.14	21 2 28.9	5.4	5.2	0.37	28	1 47.2	20 14 46.43	21 30 19.0	5.9	5.7	0.41
13	0 41.3	16 11 14.77	21 18 53.1	5.4	5.2	0.37	29	1 48.5	20 20 0.19	21 14 13.4	5.9	5.7	0.41
14	0 42.6	16 16 30.54	21 34 40.8	5.4	5.2	0.37	30	1 49.8	20 25 12.69	20 57 30.5	5.9	5.7	0.41
15	0 43.9	16 21 47.44	−21 49 51.6	5.4	5.2	0.37	31	1 51.0	20 30 23.88	−20 40 11.4	5.9	5.7	0.41
16	0 45.2	16 27 5.43	−22 4 24.6	5.4	5.2	0.37	32	1 52.2	20 35 33.76	−20 22 16.3	6.0	5.8	0.41

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	18 58.9	7 42 20.75	+22 14 26.0	6.1	3.5	0.26	Nov. 16	17 27.7	9 12 13.34	+18 17 24.8	8.1	4.6	0.32
2	18 57.3	7 44 42.11	22 9 55.7	6.1	3.5	0.26	17	17 25.2	9 13 39.31	18 13 2.4	8.2	4.7	0.33
3	18 55.7	7 47 2.59	22 5 20.6	6.2	3.5	0.26	18	17 22.6	9 15 3.61	18 8 46.3	8.2	4.7	0.33
4	18 54.1	7 49 22.17	22 0 40.8	6.2	3.5	0.26	19	17 20.1	9 16 26.19	18 4 36.7	8.3	4.7	0.33
5	18 52.5	7 51 40.84	21 55 56.4	6.2	3.6	0.26	20	17 17.5	9 17 47.03	18 0 34.1	8.4	4.8	0.34
6	18 50.8	7 53 58.59	+21 51 7.7	6.3	3.6	0.26	21	17 14.9	9 19 6.08	+17 56 38.8	8.4	4.8	0.34
7	18 49.2	7 56 15.40	21 46 14.9	6.3	3.6	0.26	22	17 12.2	9 20 23.32	17 52 51.1	8.5	4.8	0.34
8	18 47.5	7 58 31.28	21 41 18 2	6.3	3.6	0.27	23	17 9.6	9 21 38.70	17 49 11.4	8.6	4.9	0.34
9	18 45.8	8 0 46.22	21 36 17.8	6.4	3.6	0.27	24	17 6.9	9 22 52.19	17 45 39.9	8.6	4.9	0.35
10	18 44.1	8 3 0.21	21 31 13.9	6.4	3.7	0.27	25	17 4.1	9 24 3.75	17 42 16.9	8.7	5.0	0.35
11	18 42.4	8 5 13.23	+21 26 6.6	6.4	3.7	0.27	26	17 1.3	9 25 13.34	+17 39 2.9	8.8	5.0	0.35
12	18 40.7	8 7 25.28	21 20 56.2	6.5	3.7	0.27	27	16 58.5	9 26 20.93	17 35 58.1	8.8	5.0	0.36
13	18 38.9	8 9 36.34	21 15 42.8	6.5	3.7	0.27	28	16 55.7	9 27 26.47	17 33 2.7	8.9	5.1	0.36
14	18 37.1	8 11 46.41	21 10 26.7	6.6	3.7	0.27	29	16 52.8	9 28 29.93	17 30 17.1	9.0	5.1	0.36
15	18 35.3	8 13 55.48	21 5 8.1	6.6	3.8	0.27	30	16 49.9	9 29 31.27	17 27 41.7	9.0	5.2	0.37
16	18 33.5	8 16 3.53	+20 59 47.3	6.6	3.8	0.27	Dec. 1	16 47.0	9 30 30.46	+17 25 16.7	9.1	5.2	0.37
17	18 31.7	8 18 10.54	20 54 24.4	6.7	3.8	0.27	2	16 44.0	9 31 27.46	17 23 2.3	9.2	5.2	0.37
18	18 29.9	8 20 16.50	20 48 59.6	6.7	3.8	0.28	3	16 41.0	9 32 22.23	17 20 58 9	9.3	5.3	0.37
19	18 28.0	8 22 21.41	20 43 33.3	6.8	3.8	0.28	4	16 37.9	9 33 14.73	17 19 6.8	9.3	5.3	0.38
20	18 26.2	8 24 25.24	20 38 5.7	6.8	3.9	0.28	5	16 34.8	9 34 4.93	17 17 26.1	9.4	5.4	0.38
21	18 24.3	8 26 27.98	+20 32 37.0	6.8	3.9	0.28	6	16 31.6	9 34 52.80	+17 15 57.2	9.5	5.4	0.38
22	18 22.3	8 28 29.61	20 27 7.4	6.9	3.9	0.28	7	16 28.4	9 35 38.29	17 14 40.4	9.6	5.5	0.38
23	18 20.4	8 30 30.10	20 21 37.1	6.9	3.9	0 28	8	16 25.2	9 36 21.38	17 13 36.0	9.7	5.5	0.39
24	18 18.5	8 32 29.45	20 16 6.4	6.9	4.0	0.28	9	16 22.0	9 37 2.02	17 12 44.2	9.7	5.6	0.39
25	18 16.5	8 34 27.62	20 10 35.7	7.0	4.0	0.28	10	16 18.7	9 37 40.16	17 12 5.2	9.8	5.6	0.39
26	18 14.5	8 36 24.60	+20 5 5.1	7.0	4.0	0.28	11	16 15.4	9 38 15.76	+17 11 39.3	9.9	5.6	0.40
27	18 12.5	8 38 20.38	19 59 34 9	7.1	4.0	0.29	12	16 12.0	9 38 48.79	17 11 26.9	10.0	5.7	0.40
28	18 10.5	8 40 14.94	19 54 5.4	7.1	4.1	0.29	13	16 8.5	9 39 19.20	17 11 28.2	10.1	5.8	0.40
29	18 8.4	8 42 8.25	19 48 36.8	7.2	4.1	0.29	14	16 5.1	9 39 46.94	17 11 43.4	10.2	5.8	0.41
30	18 6.4	8 44 0.29	19 43 9.3	7.2	4.1	0.29	15	16 1.5	9 40 11.97	17 12 12.7	10.2	5.8	0.41
31	18 4.3	8 45 51.04	+19 37 43.2	7.3	4.1	0.29	16	15 58.0	9 40 34.24	+17 12 56.4	10.3	5.9	0.41
Nov. 1	18 2.2	8 47 40.49	19 32 18.9	7.3	4.2	0.29	17	15 54.4	9 40 53.70	17 13 54.8	10.4	5.9	0.42
2	18 0.0	8 49 28.62	19 26 56.4	7.4	4.2	0.30	18	15 50.7	9 41 10.30	17 15 8.0	10.5	6.0	0.42
3	17 57.9	8 51 15.41	19 21 36.0	7.4	4.2	0.30	19	15 47.0	9 41 24.00	17 16 36.3	10.6	6.0	0.42
4	17 55.7	8 53 0.85	19 16 18.0	7.4	4.2	0.30	20	15 43.3	9 41 34.74	17 18 19.7	10.7	6.1	0.43
5	17 53.5	8 54 44.91	+19 11 2.7	7.5	4.3	0.30	21	15 39.5	9 41 42.49	+17 20 18.5	10.8	6.1	0.43
6	17 51.3	8 56 27.58	19 5 50.3	7.6	4.3	0.30	22	15 35.7	9 41 47.20	17 22 33.0	10.9	6.2	0.43
7	17 49.0	8 58 8.84	19 0 41.0	7.6	4.3	0.30	23	15 31.8	9 41 48.82	17 25 3.1	11.0	6.2	0.43
8	17 46.7	8 59 48.67	18 55 35.2	7.6	4.4	0.31	24	15 27.8	9 41 47.32	17 27 48.7	11.0	6.3	0.44
9	17 44.4	9 1 27.05	18 50 33.1	7.7	4.4	0.31	25	15 23.8	9 41 42.66	17 30 50.0	11.1	6.4	0.44
10	17 42.1	9 3 3.96	+18 45 34.9	7.8	4.4	0.31	26	15 19.7	9 41 34.82	+17 34 6.9	11.2	6.4	0.44
11	17 39.8	9 4 39.38	18 40 41.0	7.8	4.5	0.31	27	15 15.5	9 41 23.78	17 37 39.4	11.3	6.4	0.45
12	17 37.4	9 6 13.30	18 35 51.6	7.9	4.5	0.31	28	15 11.4	9 41 9.49	17 41 27.3	11.4	6.5	0.45
13	17 35.0	9 7 45.68	18 31 7.0	7.9	4.5	0.32	29	15 7.1	9 40 51.94	17 45 30.6	11.5	6.6	0.45
14	17 32.6	9 9 16.50	18 26 27.5	8.0	4.6	0.32	30	15 2.9	9 40 31.11	17 49 49.1	11.6	6.6	0.45
15	17 30.1	9 10 45.73	+18 21 53.3	8.0	4 6	0.32	31	14 58.6	9 40 7.00	+17 54 22.6	11.6	6.6	0.46
16	17 27.7	9 12 13.34	+18 17 24.8	8.1	4.6	0.32	32	14 54.2	9 39 39.61	+17 59 10.9	11.7	6.7	0.46

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 0	10 54.2	5 36 8.81	+23 0 45.7	2.1	22.6	1.74
1	10 49.7	5 35 36.28	23 0 36.6	2.1	22.6	1.74
2	10 45.3	5 35 4.15	23 0 27.6	2.1	22.6	1.74
3	10 40.9	5 34 32.43	23 0 18.4	2.1	22.5	1.74
4	10 36.4	5 34 1.15	23 0 9.1	2.1	22.5	1.74
5	10 32.0	5 33 30.33	+22 59 59.7	2.1	22 5	1.74
6	10 27.6	5 33 0.00	22 59 50.2	2.1	22.4	1.73
7	10 23.2	5 32 30.17	22 59 40.8	2.1	22.4	1.73
8	10 18.8	5 32 0.87	22 59 31.5	2.1	22.4	1.72
9	10 14.4	5 31 32.12	22 59 22.3	2.1	22.3	1.72
10	10 10.0	5 31 3.95	+22 59 13.1	2.1	22.3	1.72
11	10 5.6	5 30 36.37	22 59 4.1	2.1	22.2	1.71
12	10 1.2	5 30 9.40	22 58 55.3	2.1	22.2	1.71
13	9 56.8	5 29 43.06	22 58 46.6	2.1	22.2	1.71
14	9 52.4	5 29 17.39	22 58 38.2	2.1	22.1	1.70
15	9 48.1	5 28 52.38	+22 58 30.0	2.1	22.1	1.70
16	9 43.7	5 28 28.04	22 58 22.1	2.1	22.1	1.70
17	9 39.4	5 28 4.39	22 58 14.5	2.1	22.0	1.69
18	9 35.1	5 27 41.45	22 58 7.2	2.1	22.0	1.69
19	9 30.8	5 27 19.23	22 58 0.3	2.1	21.9	1.69
20	9 26.5	5 26 57.74	+22 57 53.7	2.1	21.9	1.68
21	9 22.2	5 26 37.00	22 57 47.6	2.1	21.8	1.68
22	9 17.9	5 26 17.01	22 57 42.0	2.1	21.8	1.67
23	9 13.7	5 25 57.78	22 57 36.9	2.0	21.7	1.67
24	9 9.4	5 25 39.33	22 57 32.2	2.0	21.6	1.66
25	9 5.2	5 25 21.66	+22 57 28.0	2.0	21.6	1.66
26	9 1.0	5 25 4.78	22 57 24.4	2.0	21.5	1.65
27	8 56.8	5 24 48.72	22 57 21.4	2.0	21.4	1.65
28	8 52.6	5 24 33.46	22 57 19.0	2.0	21.4	1.65
29	8 48.4	5 24 19.03	22 57 17.2	2.0	21.3	1.64
30	8 44.2	5 24 5.42	+22 57 15.9	2.0	21.3	1.64
31	8 40.1	5 23 52.64	22 57 15.3	2.0	21.2	1.63
Feb. 1	8 36.0	5 23 40.70	22 57 15.3	2.0	21.2	1.63
2	8 31.9	5 23 29.61	22 57 16.0	2.0	21.1	1.63
3	8 27.8	5 23 19.37	22 57 17.4	2.0	21.1	1.62
4	8 23.7	5 23 10.00	+22 57 19.4	2.0	21.0	1.62
5	8 19.6	5 23 1.47	22 57 22.1	2.0	20.9	1.61
6	8 15.5	5 22 53.82	22 57 25.5	2.0	20.9	1.61
7	8 11.5	5 22 47.05	22 57 29.7	2.0	20.8	1.60
8	8 7.5	5 22 41.14	22 57 34.6	1.9	20.7	1.60
9	8 3.5	5 22 36.12	+22 57 40.2	1.9	20.7	1.59
10	7 59.5	5 22 31.96	22 57 46.6	1.9	20.6	1.59
11	7 55.5	5 22 28.68	22 57 53.7	1.9	20.6	1.58
12	7 51.6	5 22 26.29	22 58 1.6	1.9	20.5	1.58
13	7 47.6	5 22 24.77	22 58 10.2	1.9	20.5	1.57
14	7 43.6	5 22 24.13	+22 58 19.5	1.9	20.4	1.57
15	7 39.7	5 22 24.36	+22 58 29.6	1.9	20.3	1.56
Feb. 15	7 39.7	5 22 24.36	+22 58 29.6	1.9	20.3	1.56
16	7 35.8	5 22 25.45	22 58 40.4	1.9	20.2	1.56
17	7 31.9	5 22 27.41	22 58 52.0	1.9	20.2	1.55
18	7 28.0	5 22 30.24	22 59 4.2	1.9	20.1	1.55
19	7 24.1	5 22 33.91	22 59 17.1	1.9	20.0	1.54
20	7 20.3	5 22 38.46	+22 59 30.8	1.9	19.9	1.54
21	7 16.4	5 22 43.86	22 59 45.3	1.9	19.9	1.53
22	7 12.6	5 22 50.11	23 0 0.4	1.9	19.8	1.53
23	7 8.8	5 22 57.20	23 0 16.2	1.9	19.8	1.52
24	7 5.0	5 23 5.12	23 0 32.6	1.8	19.7	1.52
25	7 1.2	5 23 13.87	+23 0 49.7	1.8	19.7	1.51
26	6 57.4	5 23 23.45	23 1 7.5	1.8	19.6	1.51
27	6 53.6	5 23 33.86	23 1 26.0	1.8	19.5	1.50
28	6 49.9	5 23 45.10	23 1 45.0	1.8	19.4	1.50
Mar. 1	6 46.2	5 23 57.17	23 2 4.7	1.8	19.4	1.49
2	6 42.5	5 24 10.05	+23 2 24.9	1.8	19.3	1.49
3	6 38.8	5 24 23.73	23 2 45.7	1.8	19.2	1.48
4	6 35.1	5 24 38.22	23 3 7.0	1.8	19.2	1.48
5	6 31.4	5 24 53.51	23 3 28.9	1.8	19.1	1.47
6	6 27.7	5 25 9.60	23 3 51.3	1.8	19.1	1.47
7	6 24.0	5 25 26.46	+23 4 14.1	1.8	19.0	1.46
8	6 20.4	5 25 44.11	23 4 37.3	1.8	18.9	1.46
9	6 16.8	5 26 2.53	23 5 1.1	1.8	18.9	1.45
10	6 13.2	5 26 21.73	23 5 25.4	1.8	18.8	1.45
11	6 9.6	5 26 41.69	23 5 50.0	1.8	18.8	1.44
12	6 6.0	5 27 2.40	+23 6 15.0	1.8	18.7	1.44
13	6 2.4	5 27 23.85	23 6 40.3	1.8	18.6	1.43
14	5 58.8	5 27 46.04	23 7 5.9	1.8	18.6	1.43
15	5 55.3	5 28 8.96	23 7 31.9	1.8	18.5	1.42
16	5 51.8	5 28 32.59	23 7 58.1	1.7	18.4	1.42
17	5 48.3	5 28 56.94	+23 8 24.6	1.7	18.4	1.42
18	5 44.8	5 29 21.99	23 8 51.4	1.7	18.3	1.41
19	5 41.3	5 29 47.74	23 9 18.4	1.7	18.3	1.41
20	5 37.8	5 30 14.18	23 9 45.5	1.7	18.2	1.41
21	5 34.3	5 30 41.29	23 10 12.8	1.7	18.2	1.40
22	5 30.8	5 31 9.07	+23 10 40.2	1.7	18.1	1.40
23	5 27.3	5 31 37.52	23 11 7.6	1.7	18.1	1.39
24	5 23.9	5 32 6.61	23 11 35.1	1.7	18.0	1.39
25	5 20.4	5 32 36.35	23 12 2.6	1.7	18.0	1.38
26	5 16.9	5 33 6.72	23 12 30.2	1.7	17.9	1.38
27	5 13.5	5 33 37.72	+23 12 57.8	1.7	17.9	1.37
28	5 10.1	5 34 9.34	23 13 25.3	1.7	17.8	1.37
29	5 6.7	5 34 41.59	23 13 52.7	1.7	17.8	1.37
30	5 3.3	5 35 14.44	23 14 20.1	1.7	17.7	1.36
31	5 0.0	5 35 47.90	+23 14 47.3	1.7	17.7	1.36

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	19 28.8	8 12 16.63	+20 13 42.7	1.6	17.0	1.29	Nov. 16	16 43.4	8 27 48.62	+19 30 9.2	1.8	19.5	1.47
2	19 25.4	8 12 51.33	20 12 2.7	1.6	17.0	1.29	17	16 39.5	8 27 51.64	19 30 10.2	1.8	19.6	1.47
3	19 22.1	8 13 25.48	20 10 24.1	1.6	17.1	1.29	18	16 35.6	8 27 53.85	19 30 14.1	1.8	19.6	1.48
4	19 18.7	8 13 59.07	20 8 46.8	1.6	17.1	1.30	19	16 31.7	8 27 55.25	19 30 20.8	1.8	19.7	1.48
5	19 15.3	8 14 32.10	20 7 10.9	1.6	17.2	1.30	20	16 27.8	8 27 55.84	19 30 30.4	1.8	19.8	1.49
6	19 11.9	8 15 4.57	+20 5 36.4	1.6	17.2	1.30	21	16 23.8	8 27 55.62	+19 30 42.9	1.8	19.9	1.49
7	19 8.5	8 15 36.47	20 4 3.4	1.6	17.3	1.31	22	16 19.9	8 27 54.58	19 30 58.2	1.8	19.9	1.50
8	19 5.1	8 16 7.79	20 2 32.0	1.6	17.3	1.31	23	16 15.9	8 27 52.72	19 31 16.4	1.9	20.0	1.50
9	19 1.7	8 16 38.54	20 1 2.2	1.6	17.4	1.31	24	16 11.9	8 27 50.04	19 31 37.5	1.9	20.1	1.51
10	18 58.2	8 17 8.68	19 59 33.9	1.6	17.4	1.32	25	16 7.9	8 27 46.54	19 32 1.5	1.9	20.1	1.51
11	18 54.8	8 17 38.23	+19 58 7.3	1.6	17.5	1.32	26	16 3.9	8 27 42.22	+19 32 28.4	1.9	20.2	1.52
12	18 51.4	8 18 7.16	19 56 42.4	1.6	17.5	1.32	27	15 59.9	8 27 37.08	19 32 58.1	1.9	20.2	1.52
13	18 47.9	8 18 35.50	19 55 19.2	1.6	17.6	1.33	28	15 55.9	8 27 31.12	19 33 30.6	1.9	20.3	1.52
14	18 44.4	8 19 3.22	19 53 57.8	1.7	17.6	1.33	29	15 51.8	8 27 24.35	19 34 6.0	1.9	20.3	1.53
15	18 40.9	8 19 30.32	19 52 38.2	1.7	17.7	1.34	30	15 47.8	8 27 16.77	19 34 44.2	1.9	20.4	1.53
16	18 37.4	8 19 56.79	+19 51 20.4	1.7	17.7	1.34	Dec. 1	15 43.7	8 27 8.40	+19 35 25.2	1.9	20.4	1.53
17	18 33.9	8 20 22.63	19 50 4.6	1.7	17.8	1.35	2	15 39.6	8 26 59.20	19 36 8.9	1.9	20.5	1.54
18	18 30.3	8 20 47.83	19 48 50.8	1.7	17.8	1.35	3	15 35.5	8 26 49.20	19 36 55.3	1.9	20.5	1.54
19	18 26.8	8 21 12.38	19 47 39.0	1.7	17.9	1.35	4	15 31.4	8 26 38.41	19 37 44.5	1.9	20.6	1.55
20	18 23.3	8 21 36.27	19 46 29.2	1.7	17.9	1.36	5	15 27.3	8 26 26.83	19 38 36.4	1.9	20.6	1.55
21	18 19.8	8 21 59.49	+19 45 21.5	1.7	18.0	1.36	6	15 23.2	8 26 14.46	+19 39 30.9	1.9	20.7	1.56
22	18 16.2	8 22 22.04	19 44 15.8	1.7	18.0	1.36	7	15 19.1	8 26 1.32	19 40 28.0	1.9	20.7	1.56
23	18 12.7	8 22 43.91	19 43 12.4	1.7	18.1	1.37	8	15 14.9	8 25 47.41	19 41 27.6	1.9	20.8	1.56
24	18 9.1	8 23 5.09	19 42 11.2	1.7	18.1	1.37	9	15 10.7	8 25 32.73	19 42 29.8	1.9	20.8	1.57
25	18 5.5	8 23 25.58	19 41 12.1	1.7	18.2	1.38	10	15 6.5	8 25 17.30	19 43 34.5	1.9	20.9	1.57
26	18 1.9	8 23 45.37	+19 40 15.4	1.7	18.3	1.38	11	15 2.3	8 25 1.13	+19 44 41.7	2.0	20.9	1.57
27	17 58.3	8 24 4.45	19 39 21.0	1.7	18.4	1.38	12	14 58.1	8 24 44.21	19 45 51.2	2.0	21.0	1.58
28	17 54.6	8 24 22.81	19 38 29.0	1.7	18.4	1.39	13	14 53.8	8 24 26.56	19 47 3.0	2.0	21.0	1.58
29	17 51.0	8 24 40.45	19 37 39.4	1.7	18.5	1.39	14	14 49.6	8 24 8.19	19 48 17.1	2.0	21.1	1.58
30	17 47.3	8 24 57.36	19 36 52.2	1.7	18.5	1.39	15	14 45.3	8 23 49.11	19 49 33.5	2.0	21.1	1.59
31	17 43.7	8 25 13.54	+19 36 7.5	1.7	18.6	1.40	16	14 41.1	8 23 29.33	+19 50 52.1	2.0	21.2	1.59
Nov. 1	17 40.0	8 25 28.98	19 35 25.3	1.7	18.6	1.40	17	14 36.8	8 23 8.85	19 52 12.8	2.0	21.2	1.60
2	17 36.3	8 25 43.68	19 34 45.6	1.7	18.7	1.41	18	14 32.6	8 22 47.69	19 53 35.6	2.0	21.3	1.60
3	17 32.6	8 25 57.62	19 34 8.6	1.8	18.7	1.41	19	14 28.3	8 22 25.86	19 55 0.5	2.0	21.3	1.60
4	17 28.9	8 26 10.81	19 33 34.1	1.8	18.8	1.42	20	14 24.0	8 22 3.37	19 56 27.3	2.0	21.4	1.61
5	17 25.2	8 26 23.23	+19 33 2.3	1.8	18.8	1.42	21	14 19.7	8 21 40.24	+19 57 56.0	2.0	21.4	1.61
6	17 21.5	8 26 34.88	19 32 32.9	1.8	18.9	1.43	22	14 15.4	8 21 16.48	19 59 26.6	2.0	21.4	1.62
7	17 17.7	8 26 45.76	19 32 6.2	1.8	19.0	1.43	23	14 11.0	8 20 52.12	20 0 58.9	2.0	21.5	1.62
8	17 14.0	8 26 55.88	19 31 42.2	1.8	19.1	1.44	24	14 6.7	8 20 27.14	20 2 32.9	2.0	21.5	1.62
9	17 10.2	8 27 5.22	19 31 21.0	1.8	19.1	1.44	25	14 2.3	8 20 1.56	20 4 8.6	2.0	21.5	1.63
10	17 6.4	8 27 13.80	+19 31 2.4	1.8	19.2	1.44	26	13 58.0	8 19 35.42	+20 5 45.9	2.0	21.6	1.63
11	17 2.6	8 27 21.58	19 30 46.7	1.8	19.2	1.45	27	13 53.6	8 19 8.73	20 7 24.6	2.0	21.6	1.63
12	16 58.8	8 27 28.57	19 30 33.6	1.8	19.3	1.45	28	13 49.2	8 18 41.49	20 9 4.6	2.0	21.6	1.64
13	16 54.9	8 27 34.78	19 30 23.3	1.8	19.3	1.45	29	13 44.8	8 18 13.75	20 10 45.9	2.0	21.7	1.64
14	16 51.1	8 27 40.19	19 30 15.8	1.8	19.4	1.46	30	13 40.4	8 17 45.51	20 12 28.4	2.0	21.7	1.64
15	16 47.2	8 27 44.81	+19 30 11.1	1.8	19.5	1.46	31	13 36.0	8 17 16.80	+20 14 12.1	2.0	21.7	1.64
16	16 43.4	8 27 48.62	+19 30 9.2	1.8	19.5	1.47	32	13 31.6	8 16 47.63	+20 15 56.8	2.0	21.8	1.65

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	8 29.7	3 11 14.33	+15 27 3.5	1.0	9.2	0.68	Feb. 15	5 29.8	3 12 8.67	+15 44 16.4	1.0	8.5	0.63
1	8 25.6	3 11 5.69	15 26 45.2	1.0	9.2	0.68	16	5 26.1	3 12 20.09	15 45 19.1	1.0	8.5	0.63
2	8 21.6	3 10 57.45	15 26 28.8	1.0	9.2	0.68	17	5 22.3	3 12 31.91	15 46 23.3	1.0	8.5	0.63
3	8 17.5	3 10 49.62	15 26 14.1	1.0	9.2	0.68	18	5 18.6	3 12 44.13	15 47 28.9	1.0	8.5	0.63
4	8 13.5	3 10 42.21	15 26 1.2	1.0	9.2	0.68	19	5 14.9	3 12 56.75	15 48 35.8	1.0	8.4	0.63
5	8 9.4	3 10 35.22	+15 25 50.0	1.0	9.2	0.68	20	5 11.1	3 13 9.78	+15 49 44.1	1.0	8.4	0.63
6	8 5.4	3 10 28.67	15 25 40.8	1.0	9.2	0.68	21	5 7.4	3 13 23.19	15 50 54.0	1.0	8.4	0.63
7	8 1.4	3 10 22.53	15 25 33.4	1.0	9.2	0 68	22	5 3.7	3 13 36.99	15 52 5.1	1.0	8.4	0.62
8	7 57.3	3 10 16.82	15 25 27.8	1.0	9.1	0.67	23	5 0.0	3 13 51.18	15 53 17.6	1.0	8.4	0.62
9	7 53.3	3 10 11.55	15 25 24.0	1.0	9.1	0.67	24	4 56.3	3 14 5.75	15 54 31.5	0.9	8.4	0.62
10	7 49.3	3 10 6.72	+15 25 22.1	1.0	9.1	0.67	25	4 52.7	3 14 20.69	+15 55 46.7	0.9	8.4	0.62
11	7 45.3	3 10 2.33	15 25 21.9	1.0	9.1	0.67	26	4 49.0	3 14 36.01	15 57 3.2	0.9	8.4	0.62
12	7 41.3	3 9 58.38	15 25 23.7	1.0	9.1	0.67	27	4 45.3	3 14 51.70	15 58 20.9	0.9	8.3	0.62
13	7 37.3	3 9 54.88	15 25 27.3	1.0	9.1	0.67	28	4 41.6	3 15 7.77	15 59 39.8	0.9	8.3	0.62
14	7 33.3	3 9 51.82	15 25 32.9	1.0	9.0	0.67	29	4 38.0	3 15 24.20	+16 0 59.9	0.9	8.3	0.62
15	7 29.4	3 9 49.20	+15 25 40.1	1.0	9.0	0.67							
16	7 25.4	3 9 47.05	15 25 49.4	1.0	9.0	0.66	Sept. 1	17 48.7	4 33 40.55	+20 3 1.7	1.0	8.7	0.66
17	7 21.4	3 9 45.33	15 26 0.5	1.0	9.0	0.66	2	17 44.9	4 33 49.40	20 3 11.6	1.0	8.7	0.66
18	7 17.5	3 9 44.06	15 26 13.4	1.0	9.0	0.66	3	17 41.1	4 33 57.95	20 3 20.5	1.0	8.7	0.66
19	7 13.5	3 9 43.24	15 26 28.1	1.0	9.0	0.66	4	17 37.3	4 34 5.99	20 3 28.4	1.0	8.7	0.66
20	7 9.6	3 9 42.87	+15 26 44.7	1.0	9.0	0.66	5	17 33.5	4 34 13.59	+20 3 35.4	1.0	8.7	0.66
21	7 5.6	3 9 42.94	15 27 3.2	1.0	8.9	0.66	6	17 29.7	4 34 20.75	20 3 41.5	1.0	8.7	0.66
22	7 1.7	3 9 43.46	15 27 23.5	1.0	8.9	0.66	7	17 25.9	4 34 27.46	20 3 46.6	1.0	8.7	0.66
23	6 57.8	3 9 44.43	15 27 45.6	1.0	8.9	0.66	8	17 22.0	4 34 33.73	20 3 50.8	1.0	8.8	0.66
24	6 53.9	3 9 45.84	15 28 9.6	1.0	8.9	0.66	9	17 18.2	4 34 39.56	20 3 53.9	1.0	8.8	0.66
25	6 50.0	3 9 47.70	+15 28 35.3	1.0	8.9	0.65	10	17 14.4	4 34 44.93	+20 3 56.2	1.0	8.8	0.67
26	6 46.1	3 9 50.01	15 29 2.9	1.0	8.8	0.65	11	17 10.5	4 34 49.87	20 3 57.5	1.0	8.8	0.67
27	6 42.2	3 9 52.76	15 29 32.2	1.0	8.8	0.65	12	17 6.7	4 34 54.35	20 3 58.0	1.0	8.8	0.67
28	6 38.4	3 9 55.96	15 30 3.3	1.0	8.8	0.65	13	17 2.8	4 34 58.38	20 3 57.4	1.0	8.8	0.67
29	6 34.5	3 9 59.60	15 30 36.2	1.0	8.8	0.65	14	16 58.9	4 35 1.95	20 3 56.0	1.0	8.8	0 67
30	6 30.6	3 10 3.70	+15 31 11.0	1.0	8.8	0.65	15	16 55.1	4 35 5.09	+20 3 53.5	1.0	8.8	0.67
31	6 26.8	3 10 8.23	15 31 47.3	1.0	8.8	0.65	16	16 51.2	4 35 7.76	20 3 50.2	1.0	8.9	0.67
Feb. 1	6 22.9	3 10 13.21	15 32 25.4	1.0	8.7	0.64	17	16 47.3	4 35 9.97	20 3 46.0	1.0	8.9	0.67
2	6 19.1	3 10 18.64	15 33 5.4	1.0	8.7	0.64	18	16 43.4	4 35 11.72	20 3 40.9	1.0	8.9	0.68
3	6 15.2	3 10 24.50	15 33 47.2	1.0	8.7	0.64	19	16 39.4	4 35 13.03	20 3 34.8	1.0	8.9	0.68
4	6 11.4	3 10 30.80	+15 34 30.5	1.0	8.7	0.64	20	16 35.5	4 35 13.87	+20 3 27.9	1.0	8.9	0.68
5	6 7.6	3 10 37.55	15 35 15.6	1.0	8.7	0.64	21	16 31.6	4 35 14.26	20 3 20.0	1.0	9.0	0.68
6	6 3.8	3 10 44.74	15 36 2.4	1.0	8.7	0.64	22	16 27.7	4 35 14.18	20 3 11.3	1.0	9.0	0.68
7	6 0.0	3 10 52.36	15 36 50.9	1.0	8.6	0.64	23	16 23.7	4 35 13.65	20 3 1.6	1.0	9.0	0.68
8	5 56.2	3 11 0.41	15 37 41.0	1.0	8.6	0.64	24	16 19.8	4 35 12.65	20 2 51.1	1.0	9.0	0.68
9	5 52.4	3 11 8.89	+15 38 32.7	1.0	8.6	0.64	25	16 15.8	4 35 11.20	+20 2 39.8	1.0	9.0	0.68
10	5 48.6	3 11 17.81	15 39 26.0	1.0	8.6	0.63	26	16 11.9	4 35 9.28	20 2 27.5	1.0	9.0	0.69
11	5 44.8	3 11 27.15	15 40 21.0	1.0	8.6	0.63	27	16 7.9	4 35 6.90	20 2 14.4	1.0	9.1	0.69
12	5 41.0	3 11 36.90	15 41 17.6	1.0	8.6	0.63	28	16 3.9	4 35 4.06	20 2 0.3	1.0	9.1	0.69
13	5 37.3	3 11 47.08	15 42 15.7	1.0	8.6	0.63	29	15 59.9	4 35 0.76	20 1 45.5	1.0	9.1	0.69
14	5 33.5	3 11 57.67	+15 43 15.3	1.0	8.5	0.63	30	15 55.9	4 34 56.99	+20 1 29.8	1.0	9.1	0.69
15	5 29.8	3 12 8.67	+15 44 16.4	1.0	8.5	0.63	31	15 51.9	4 34 52.79	+20 1 13.1	1.0	9.1	0.69

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	15 51.9	4 34 52.79	+20 1 13.1	1.0	9.1	0.69	Nov. 16	12 40.9	4 24 41.26	+19 35 51.0	1.1	9.6	0.73
2	15 47.9	4 34 48.12	20 0 55.6	1.0	9.1	0.69	17	12 36.6	4 24 21.46	19 35 6.6	1.1	9.7	0.73
3	15 43.9	4 34 43.01	20 0 37.4	1.0	9.1	0.69	18	12 32 4	4 24 1.54	19 34 22.2	1.1	9 7	0.73
4	15 39.9	4 34 37.43	20 0 18.3	1.0	9.2	0.70	19	12 28.1	4 23 41.50	19 33 37.5	1.1	9.7	0.73
5	15 35.8	4 34 31.43	19 59 58.4	1.0	9.2	0.70	20	12 23.9	4 23 21.35	19 32 52.7	1.1	9.7	0 73
6	15 31.8	4 34 24.97	+19 59 37.6	1.0	9.2	0.70	21	12 19.6	4 23 1.11	+19 32 7.9	1.1	9.7	0.73
7	15 27.7	4 34 18.07	19 59 16.0	1.0	9.2	0.70	22	12 15.3	4 22 40.79	19 31 23.0	1.1	9.7	0.73
8	15 23.7	4 34 10.74	19 58 53.7	1.0	9.2	0.70	23	12 11.0	4 22 20.39	19 30 38.0	1.1	9.7	0.73
9	15 19.6	4 34 2.99	19 58 30.5	1.0	9.3	0.70	24	12 6.8	4 21 59.93	19 29 53.0	1.1	9.7	0.73
10	15 15.6	4 33 54.80	19 58 6.5	1.0	9.3	0.70	25	12 2.5	4 21 39.42	19 29 7.9	1.1	9.7	0.73
11	15 11.5	4 33 46.19	+19 57 41.6	1.1	9.3	0.70	26	11 58.2	4 21 18.87	+19 28 22.9	1.1	9.7	0.73
12	15 7.4	4 33 37.15	19 57 16.1	1.1	9.3	0.70	27	11 53.9	4 20 58.29	19 27 38.0	1.1	9.7	0.73
13	15 3.3	4 33 27.70	19 56 49.8	1.1	9.3	0.71	28	11 49.7	4 20 37.71	19 26 53.3	1.1	9.7	0.73
14	14 59.2	4 33 17.83	19 56 22.8	1.1	9.3	0.71	29	11 45.4	4 20 17.12	19 26 8.6	1.1	9.7	0.73
15	14 55.1	4 33 7.57	19 55 55.0	1.1	9.3	0.71	30	11 41.1	4 19 56.54	19 25 24.1	1.1	9.7	0.73
16	14 51.0	4 32 56.90	+19 55 26.6	1.1	9.3	0.71	Dec. 1	11 36.8	4 19 35.99	+19 24 39.7	1.1	9.7	0.73
17	14 46.9	4 32 45.84	19 54 57.4	1.1	9.4	0.71	2	11 32.6	4 19 15.48	19 23 55.7	1.1	9.7	0.73
18	14 42.8	4 32 34.37	19 54 27.5	1.1	9.4	0.71	3	11 28.3	4 18 55.01	19 23 11.7	1.1	9.7	0.73
19	14 38.6	4 32 22.51	19 53 56.8	1.1	9.4	0.71	4	11 24.0	4 18 34.61	19 22 28.1	1.1	9.7	0.73
20	14 34.5	4 32 10.26	19 53 25.4	1.1	9.4	0.71	5	11 19.8	4 18 14.28	19 21 44.7	1.1	9.7	0.73
21	14 30.4	4 31 57.64	+19 52 53.4	1.1	9.4	0.71	6	11 15.5	4 17 54.04	+19 21 1.7	1.1	9.7	0.73
22	14 26.2	4 31 44.64	19 52 20.7	1.1	9.4	0.71	7	11 11.2	4 17 33.89	19 20 19.1	1.1	9.7	0.73
23	14 22.1	4 31 31.29	19 51 47.4	1.1	9.4	0.71	8	11 6.9	4 17 13.86	19 19 36.9	1.1	9.7	0.73
24	14 17.9	4 31 17.56	19 51 13.5	1.1	9.4	0.72	9	11 2.7	4 16 53.94	19 18 55.0	1.1	9.7	0.73
25	14 13.7	4 31 3.49	19 50 38.9	1.1	9.5	0.72	10	10 58.4	4 16 34.15	19 18 13.6	1.1	9.6	0.73
26	14 9.6	4 30 49.07	+19 50 3.7	1.1	9.5	0.72	11	10 54.2	4 16 14.51	+19 17 32.7	1.1	9.6	0.73
27	14 5.4	4 30 34.31	19 49 27.9	1.1	9.5	0.72	12	10 49.9	4 15 55.01	19 16 52.3	1.1	9.6	0.73
28	14 1.2	4 30 19.21	19 48 51.4	1.1	9.5	0.72	13	10 45.7	4 15 35.67	19 16 12.4	1.1	9.6	0.73
29	13 57.0	4 30 3.79	19 48 14.4	1.1	9.5	0.72	14	10 41.4	4 15 16.50	19 15 33.1	1.1	9.6	0.73
30	13 52.8	4 29 48.04	19 47 36.8	1.1	9.5	0.72	15	10 37.2	4 14 57.52	19 14 54.2	1.1	9.6	0.72
31	13 48.6	4 29 32.00	+19 46 58.8	1.1	9.5	0.72	16	10 32.9	4 14 38.73	+19 14 16.0	1.1	9.6	0.72
Nov. 1	13 44.4	4 29 15.65	19 46 20.2	1.1	9.5	0.72	17	10 28.7	4 14 20.14	19 13 38.5	1.1	9.6	0.72
2	13 40.2	4 28 59.02	19 45 41.1	1.1	9.5	0.72	18	10 24.4	4 14 1.76	19 13 1.7	1.1	9.6	0.72
3	13 36.0	4 28 42.11	19 45 1.4	1.1	9.5	0.72	19	10 20.2	4 13 43.62	19 12 25.4	1.1	9.6	0.72
4	13 31.8	4 28 24.92	19 44 21.2	1.1	9.5	0.72	20	10 16.0	4 13 25.70	19 11 50.0	1.1	9.6	0.72
5	13 27.6	4 28 7.48	+19 43 40.7	1.1	9.6	0.72	21	10 11.8	4 13 8.04	+19 11 15.2	1.1	9.6	0.72
6	13 23.3	4 27 49.79	19 42 59.7	1.1	9.6	0.72	22	10 7.5	4 12 50.61	19 10 41.2	1.1	9.6	0.72
7	13 19.1	4 27 31.85	19 42 18.3	1.1	9.6	0.72	23	10 3.3	4 12 33.45	19 10 7.9	1.1	9.5	0.72
8	13 14.9	4 27 13.69	19 41 36.6	1.1	9.6	0.72	24	9 59.1	4 12 16.54	19 9 35.6	1.1	9.5	0.72
9	13 10.6	4 26 55.29	19 40 54.4	1.1	9.6	0.72	25	9 54.9	4 11 59.93	19 9 4.1	1.1	9.5	0.72
10	13 6.4	4 26 36.70	+19 40 11.9	1.1	9.6	0.73	26	9 50.7	4 11 43.61	+19 8 33.6	1.1	9.5	0.72
11	13 2.2	4 26 17.90	19 39 29.1	1.1	9.6	0.73	27	9 46.5	4 11 27.60	19 8 3.8	1.1	9.5	0.72
12	12 57.9	4 25 58.91	19 38 46.1	1.1	9.6	0.73	28	9 42.3	4 11 11.88	19 7 35.0	1.1	9.5	0.72
13	12 53.7	4 25 39.75	19 38 2.7	1.1	9.6	0.73	29	9 38.1	4 10 56.50	19 7 7.1	1.1	9.5	0.72
14	12 49.4	4 25 20.41	19 37 19.0	1.1	9.6	0.73	30	9 33.9	4 10 41.43	19 6 40.2	1.1	9.5	0.72
15	12 45.2	4 25 0.91	+19 36 35.1	1.1	9.6	0.73	31	9 29.7	4 10 26.71	+19 6 14.2	1.1	9.5	0.72
16	12 40.9	4 24 41.26	+19 35 51.0	1.1	9.6	0.73	32	9 25.6	4 10 12.34	+19 5 49.3	1.1	9.5	0.72

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	16 54.0	11 36 49.71	+ 3 21 25.3	0.5	1.9	0.12	Feb. 15	13 49.3	11 33 3.36	+ 3 47 23.9	0.5	1.9	0.13
1	16 50.0	11 36 48.93	3 21 33.0	0.5	1.9	0.12	16	13 45.3	11 32 54.96	3 48 19.2	0.5	1.9	0.13
2	16 46.1	11 36 47.94	3 21 42.1	0.5	1.9	0.13	17	13 41.2	11 32 46.46	3 49 15.1	0.5	1.9	0.13
3	16 42.1	11 36 46.75	3 21 52.5	0.5	1.9	0.13	18	13 37.1	11 32 37.87	3 50 11.5	0.5	1.9	0.13
4	16 38.2	11 36 45.36	3 22 4.2	0.5	1.9	0.13	19	13 33.0	11 32 29.18	3 51 8.5	0.5	1.9	0.13
5	16 34.2	11 36 43.76	+ 3 22 17.2	0.5	1.9	0.13	20	13 29.0	11 32 20.41	+ 3 52 6.0	0.5	1.9	0.13
6	16 30.3	11 36 41.96	3 22 31.5	0.5	1.9	0.13	21	13 24.9	11 32 11.56	3 53 4.0	0.5	1.9	0.13
7	16 26.3	11 36 39.95	3 22 47.1	0.5	1.9	0.13	22	13 20.8	11 32 2.64	3 54 2.3	0.5	1.9	0.13
8	16 22.3	11 36 37.74	3 23 4.0	0.5	1.9	0.13	23	13 16.7	11 31 53.64	3 55 1.1	0.5	1.9	0.13
9	16 18.4	11 36 35.34	3 23 22.1	0.5	1.9	0.13	24	13 12.7	11 31 44.56	3 56 0.3	0.5	1.9	0.13
10	16 14.4	11 36 32.73	+ 3 23 41.5	0.5	1.9	0.13	25	13 8.6	11 31 35.42	+ 3 56 59.9	0.5	1.9	0.13
11	16 10.4	11 36 29.92	3 24 2.2	0.5	1.9	0.13	26	13 4.5	11 31 26.23	3 57 59.8	0.5	1.9	0.13
12	16 6.4	11 36 26.92	3 24 24.1	0.5	1.9	0.13	27	13 0.4	11 31 16.97	3 59 0.0	0.5	1.9	0.13
13	16 2.4	11 36 23.72	3 24 47.2	0.5	1.9	0.13	28	12 56.3	11 31 7.65	4 0 0.5	0.5	1.9	0.13
14	15 58.4	11 36 20.33	3 25 11.6	0.5	1.9	0.13	Mar. 1	12 52.2	11 30 58.29	4 1 1.3	0.5	1.9	0.13
15	15 54.4	11 36 16.75	+ 3 25 37.2	0.5	1.9	0.13	2	12 48.1	11 30 48.88	+ 4 2 2.3	0.5	1.9	0.13
16	15 50 4	11 36 12.98	3 26 3.9	0.5	1.9	0.13	3	12 44.0	11 30 39.43	4 3 3.5	0.5	1.9	0.13
17	15 46.4	11 36 9.03	3 26 31.9	0.5	1.9	0.13	4	12 40.0	11 30 29.94	4 4 4.9	0.5	1.9	0.13
18	15 42.4	11 36 4.89	3 27 1.0	0.5	1.9	0.13	5	12 35.9	11 30 20.42	4 5 6.4	0.5	1.9	0.13
19	15 38.4	11 36 0.57	3 27 31.2	0.5	1.9	0.13	6	12 31.8	11 30 10.87	4 6 8.1	0.5	1.9	0.13
20	15 34.4	11 35 56.07	+ 3 28 2.6	0.5	1.9	0.13	7	12 27.7	11 30 1.29	+ 4 7 9.9	0.5	1.9	0.13
21	15 30.4	11 35 51.39	3 28 35.1	0.5	1.9	0.13	8	12 23.6	11 29 51.69	4 8 11.7	0.5	1.9	0.13
22	15 26.4	11 35 46.53	3 29 8.7	0.5	1.9	0.13	9	12 19.5	11 29 42.08	4 9 13.5	0.5	1.9	0.13
23	15 22.4	11 35 41.50	3 29 43.5	0.5	1.9	0.13	10	12 15.4	11 29 32.46	4 10 15.3	0.5	1.9	0.13
24	15 18.4	11 35 36.30	3 30 19.3	0.5	1.9	0.13	11	12 11.3	11 20 22.83	4 11 17.1	0.5	1.9	0.13
25	15 14.4	11 35 30.92	+ 3 30 56.2	0.5	1.9	0.13	12	12 7.2	11 29 13.20	+ 4 12 18.9	0.5	1.9	0.13
26	15 10.3	11 35 25.37	3 31 34.1	0.5	1.9	0.13	13	12 3.1	11 29 3.57	4 13 20.6	0.5	1.9	0.13
27	15 6.3	11 35 19.66	3 32 13.1	0.5	1.9	0.13	14	11 59.0	11 28 53.95	4 14 22.2	0.5	1.9	0.13
28	15 2.3	11 35 13.79	3 32 53.1	0.5	1.9	0.13	15	11 54.9	11 28 44.34	4 15 23.7	0.5	1.9	0.13
29	14 58.3	11 35 7.75	3 33 34.0	0.5	1.9	0.13	16	11 50.9	11 28 34.74	4 16 25.0	0.5	1.9	0.13
30	14 54.2	11 35 1.56	+ 3 34 15.9	0.5	1.9	0.13	17	11 46.8	11 28 25.17	+ 4 17 26.1	0.5	1.9	0.13
31	14 50.2	11 34 55.21	3 34 58.8	0.5	1.9	0.13	18	11 42.7	11 28 15.63	4 18 26.9	0.5	1.9	0.13
Feb. 1	14 46.1	11 34 48.71	3 35 42.7	0.5	1.9	0.13	19	11 38.6	11 28 6.11	4 19 27.5	0.5	1.9	0.13
2	14 42.1	11 34 42.06	3 36 27.5	0.5	1.9	0.13	20	11 34.5	11 27 56.61	4 20 27.8	0.5	1.9	0.13
3	14 38.0	11 34 35.26	3 37 13.2	0.5	1.9	0.13	21	11 30.4	11 27 47.15	4 21 27.9	0.5	1.9	0.13
4	14 34.0	11 34 28.31	+ 3 37 59.8	0.5	1.9	0.13	22	11 26.3	11 27 37.74	+ 4 22 27.6	0.5	1.9	0.13
5	14 30.0	11 34 21.23	3 38 47.2	0.5	1.9	0.13	23	11 22.2	11 27 28.37	4 23 27.0	0.5	1.9	0.13
6	14 25.9	11 34 14.00	3 39 35.5	0.5	1.9	0.13	24	11 18.1	11 27 19.05	4 24 26.0	0.5	1.9	0.13
7	14 21.8	11 34 6.64	3 40 24.6	0.5	1.9	0.13	25	11 14.0	11 27 9.78	4 25 24.6	0.5	1.9	0.13
8	14 17.8	11 33 59.15	3 41 14.5	0.5	1.9	0.13	26	11 10.0	11 27 0.57	4 26 22.8	0.5	1.9	0.13
9	14 13.7	11 33 51.53	+ 3 42 5.2	0.5	1.9	0.13	27	11 5.9	11 26 51.42	+ 4 27 20.6	0.5	1.9	0.13
10	14 9.7	11 33 43.79	3 42 56.6	0.5	1.9	0.13	28	11 1.8	11 26 42.32	4 28 18.0	0.5	1.9	0.13
11	14 5.6	11 33 35.93	3 43 48.7	0.5	1.9	0.13	29	10 57.7	11 26 33.30	4 29 14.8	0.5	1.9	0.13
12	14 1.6	11 33 27.95	3 44 41.5	0.5	1.9	0.13	30	10 53.6	11 26 24.35	4 30 11.1	0.5	1.9	0.13
13	13 57.5	11 33 19.86	3 45 35.0	0.5	1.9	0.13	31	10 49.6	11 26 15.47	4 31 6.9	0.5	1.9	0.13
14	13 53.4	11 33 11.66	+ 3 46 29.1	0.5	1.9	0.13	32	10 45.5	11 26 6.67	+ 4 32 2.1	0.5	1.9	0.13
15	13 49.3	11 33 3.36	+ 3 47 21.9	0.5	1.9	0.13	33	10 41.4	11 25 57.96	+ 4 32 56.7	0.5	1.9	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	10 45.5	11 26 6.67	+ 4 32 2.1	0.5	1.9	0.13	May 17	7 40.2	11 21 42.34	+ 4 58 34.4	0.5	1.9	0.12
2	10 41.4	11 25 57.96	4 32 56.7	0.5	1.9	0.13	18	7 36.3	11 21 40.54	4 58 43.2	0.5	1.9	0.12
3	10 37.3	11 25 49.33	4 33 50.6	0.5	1.9	0.13	19	7 32.3	11 21 38.91	4 58 50.7	0.5	1.9	0.12
4	10 33.3	11 25 40.78	4 34 44.0	0.5	1.9	0.13	20	7 28.3	11 21 37.49	4 58 57.0	0.5	1.9	0.12
5	10 29.2	11 25 32.34	4 35 36.7	0.5	1.9	0.13	21	7 24.4	11 21 36.27	4 59 2.1	0.5	1.9	0.12
6	10 25.1	11 25 24.00	+ 4 36 28.7	0.5	1.9	0.13	22	7 20.4	11 21 35.23	+ 4 59 5.9	0.5	1.9	0.12
7	10 21.0	11 25 15.75	4 37 20.0	0.5	1.9	0.13	23	7 16.5	11 21 34.39	4 59 8.4	0.5	1.9	0.12
8	10 17.0	11 25 7.61	4 38 10.6	0.5	1.9	0.13	24	7 12.6	11 21 33.74	4 59 9.7	0.5	1.9	0.12
9	10 12.9	11 24 59.57	4 39 0.4	0.5	1.9	0.13	25	7 8.6	11 21 33.29	4 59 9.8	0.5	1.9	0.12
10	10 8.8	11 24 51.66	4 39 49.4	0.5	1.9	0.13	26	7 4.7	11 21 33.03	4 59 8.7	0.5	1.9	0.12
11	10 4.8	11 24 43.87	+ 4 40 37.6	0.5	1.9	0.13	27	7 0.7	11 21 32.97	+ 4 59 6.3	0.5	1.9	0.12
12	10 0.7	11 24 36.17	4 41 25.1	0.5	1.9	0.13	28	6 56.8	11 21 33.10	4 59 2.6	0.5	1.9	0.12
13	9 56.7	11 24 28.60	4 42 11.8	0.5	1.9	0.13	29	6 52.9	11 21 33.42	4 58 57.7	0.5	1.8	0.12
14	9 52.6	11 24 21.17	4 42 57.5	0.5	1.9	0.13	30	6 49.0	11 21 33.95	4 58 51.5	0.5	1.8	0.12
15	9 48.5	11 24 13.87	4 43 42.4	0.5	1.9	0.13	31	6 45.0	11 21 34.67	4 58 44.1	0.5	1.8	0.12
16	9 44.5	11 24 6.69	+ 4 44 26.4	0.5	1.9	0.13	Dec. 1	19 8.7	11 52 42.52	+ 1 36 14.9	0.5	1.8	0.12
17	9 40.4	11 23 59.64	4 45 0.5	0.5	1.9	0.13	2	19 4.9	11 52 48.80	1 35 36.5	0.5	1.8	0.12
18	9 36.4	11 23 52.74	4 45 51.7	0.5	1.9	0.13	3	19 1.1	11 52 54.90	1 34 59.4	0.5	1.8	0.12
19	9 32.4	11 23 45.99	4 46 33.0	0.5	1.9	0.13	4	18 57.2	11 53 0.80	1 34 23.4	0.5	1.8	0.12
20	9 28.3	11 23 39.37	4 47 13.3	0.5	1.9	0.13	5	18 53.4	11 53 6.52	1 33 48.8	0.5	1.8	0.12
21	9 24.3	11 23 32.89	+ 4 47 52.6	0.5	1.9	0.13	6	18 49.5	11 53 12.04	+ 1 33 15.4	0.5	1.8	0.12
22	9 20.2	11 23 26.55	4 48 30.9	0.5	1.9	0.13	7	18 45.7	11 53 17.38	1 32 43.3	0.5	1.8	0.12
23	9 16.2	11 23 20.37	4 49 8.3	0.5	1.9	0.13	8	18 41.8	11 53 22.52	1 32 12.4	0.5	1.8	0.12
24	9 12.2	11 23 14.35	4 49 44.7	0.5	1.9	0.13	9	18 38.0	11 53 27.46	1 31 42.8	0.5	1.8	0.12
25	9 8.2	11 23 8.46	4 50 20.1	0.5	1.9	0.13	10	18 34.1	11 53 32.21	1 31 14.5	0.5	1.8	0.12
26	9 4.1	11 23 2.74	+ 4 50 54.4	0.5	1.9	0.13	11	18 30.3	11 53 36.77	+ 1 30 47.5	0.5	1.8	0.12
27	9 0.1	11 22 57.18	4 51 27.7	0.5	1.9	0.13	12	18 26.4	11 53 41.13	1 30 21.7	0.5	1.8	0.12
28	8 56.1	11 22 51.78	4 51 59.9	0.5	1.9	0.13	13	18 22 6	11 53 45.29	1 29 57.3	0.5	1.8	0.12
29	8 52.1	11 22 46.55	4 52 31.0	0.5	1.9	0.13	14	18 18.7	11 53 49.25	1 29 34.2	0.5	1.8	0.12
30	8 48.0	11 22 41.48	4 53 1.0	0.5	1.9	0.13	15	18 14.8	11 53 53.01	1 29 12.4	0.5	1.8	0.12
May 1	8 44.0	11 22 36.57	+ 4 53 29.9	0.5	1.9	0.13	16	18 11.0	11 53 56.57	+ 1 28 51.9	0.5	1.8	0.12
2	8 40.0	11 22 31.83	4 53 57.7	0.5	1.9	0.13	17	18 7.1	11 53 59.92	1 28 32.7	0.5	1.8	0.12
3	8 36 0	11 22 27.26	4 54 24.4	0.5	1.9	0.13	18	18 3.2	11 54 3.08	1 28 14.9	0.5	1.8	0.12
4	8 32.0	11 22 22.87	4 54 49.9	0.5	1.9	0.13	19	17 59.3	11 54 6.03	1 27 58.4	0.5	1.8	0.12
5	8 28.0	11 22 18.66	4 55 14.3	0.5	1.9	0.13	20	17 55.4	11 54 8.78	1 27 43.2	0.5	1.8	0.12
6	8 24.0	11 22 14.62	+ 4 55 37.6	0.5	1.9	0.13	21	17 51.6	11 54 11.32	+ 1 27 29.3	0.5	1.8	0.12
7	8 20.0	11 22 10.76	4 55 59.6	0.5	1.9	0.13	22	17 47.7	11 54 13.65	1 27 16.8	0.5	1.8	0.12
8	8 16.0	11 22 7.08	4 56 20.5	0.5	1.9	0.13	23	17 43.8	11 54 15.78	1 27 5.7	0.5	1.8	0.12
9	8 12.0	11 22 3.59	4 56 40.2	0.5	1.9	0.13	24	17 39.9	11 54 17.70	1 26 55.9	0.5	1.8	0.12
10	8 8.0	11 22 0.28	4 56 58.7	0.5	1.9	0.13	25	17 36.0	11 54 19.41	1 26 47.4	0.5	1.8	0.12
11	8 4.1	11 21 57.14	+ 4 57 16.1	0.5	1.9	0.13	26	17 32.1	11 54 20.92	+ 1 26 40.3	0.5	1.9	0.12
12	8 0.1	11 21 54.21	4 57 32.2	0.5	1.9	0.13	27	17 28.1	11 54 22.21	1 26 34.6	0.5	1.9	0.12
13	7 56.1	11 21 51.46	4 57 47.1	0.5	1.9	0.12	28	17 24.2	11 54 23.30	1 26 30.2	0.5	1.9	0.12
14	7 52.1	11 21 48.89	4 58 0.8	0.5	1.9	0.12	29	17 20.3	11 54 24.18	1 26 27.1	0.5	1.9	0.12
15	7 48.2	11 21 46.51	4 58 13.2	0.5	1.9	0.12	30	17 16.4	11 54 24.85	1 26 25.4	0.5	1.9	0.12
16	7 44.2	11 21 44.33	+ 4 58 24.4	0.5	1.9	0.12	31	17 12.5	11 54 25.31	+ 1 26 25.1	0.5	1.9	0.12
17	7 40.2	11 21 42.34	+ 4 58 34.4	0.5	1.9	0.12	32	17 8.6	11 54 25.57	+ 1 26 26.1	0.5	1.9	0.12

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	8 15.7	2 57 5.95	+14 58 9.2	0.3	1.3	0.09	Feb. 15	5 14.5	2 56 49.08	+14 59 51.2	0.3	1.3	0.09
1	8 11.7	2 57 2.65	14 57 58.4	0.3	1.3	0.09	16	5 10.6	2 56 51.88	15 0 7.0	0.3	1.3	0.09
2	8 7.7	2 56 59.46	14 57 48.0	0.3	1.3	0.09	17	5 6.7	2 56 54.81	15 0 23.4	0.3	1.3	0.09
3	8 3.7	2 56 56.39	14 57 38.1	0.3	1.3	0.09	18	5 2.9	2 56 57.87	15 0 40.5	0.3	1.3	0.09
4	7 59.7	2 56 53.45	14 57 28.9	0.3	1.3	0.09	19	4 59.0	2 57 1.07	15 0 58.1	0.3	1.3	0.09
5	7 55.7	2 56 50.63	+14 57 20.3	0.3	1.3	0.09	20	4 55.1	2 57 4.39	+15 1 16.1	0.3	1.3	0.09
6	7 51.8	2 56 47.93	14 57 12.2	0.3	1.3	0.09	21	4 51.2	2 57 7.84	15 1 34.7	0.3	1.3	0.09
7	7 47.8	2 56 45.35	14 57 4.7	0.3	1.3	0.09	22	4 47.4	2 57 11.42	15 1 53.8	0.3	1.3	0.09
8	7 43.8	2 56 42.89	14 56 57.8	0.3	1.3	0.09	23	4 43.5	2 57 15.12	15 2 13.5	0.3	1.3	0.09
9	7 39.8	2 56 40.56	14 56 51.4	0.3	1.3	0.09	24	4 39.6	2 57 18.95	15 2 33.6	0.3	1.3	0.09
10	7 35.9	2 56 38.37	+14 56 45.6	0.3	1.3	0.09	25	4 35.7	2 57 22.90	+15 2 54.2	0.3	1.3	0.09
11	7 31.9	2 56 36.31	14 56 40.3	0.3	1.3	0.09	26	4 31.9	2 57 26.98	15 3 15.4	0.3	1.3	0.09
12	7 27.9	2 56 34.37	14 56 35.6	0.3	1.3	0.09	27	4 28.0	2 57 31.18	15 3 37.1	0.3	1.3	0.09
13	7 24.0	2 56 32.56	14 56 31.4	0.3	1.3	0.09	28	4 24.2	2 57 35.50	+15 3 59.0	0.3	1.3	0.09
14	7 20.0	2 56 30.88	14 56 27.9	0.3	1.3	0.09							
15	7 16.1	2 56 29.34	+14 56 25.1	0.3	1.3	0.09							
16	7 12.1	2 56 27.93	14 56 22.9	0.3	1.3	0.09	Sept. 1	16 31.7	3 16 31.15	+16 19 7.6	0.3	1.3	0.09
17	7 8.2	2 56 26.66	14 56 21.3	0.3	1.3	0.09	2	16 27.8	3 16 30.01	16 18 59.7	0.3	1.3	0.09
18	7 4.2	2 56 25.51	14 56 20.2	0.3	1.3	0.09	3	16 23.8	3 16 28.75	16 18 51.4	0.3	1.3	0.09
19	7 0.3	2 56 24.50	14 56 19.7	0.3	1.3	0.09	4	16 19.9	3 16 27.36	16 18 42.6	0.3	1.3	0.09
20	6 56.3	2 56 23.63	+14 56 19.8	0.3	1.3	0.09	5	16 15.9	3 16 25.84	+16 18 33.2	0.3	1.3	0.09
21	6 52.4	2 56 22.89	14 56 20.5	0.3	1.3	0.09	6	16 12.0	3 16 24.19	16 18 23.4	0.3	1.3	0.09
22	6 48.4	2 56 22.29	14 56 21.9	0.3	1.3	0.09	7	16 8.0	3 16 22.41	16 18 13.2	0.3	1.3	0.09
23	6 44.5	2 56 21.83	14 56 23.8	0.3	1.3	0.09	8	16 4.0	3 16 20.51	16 18 2.5	0.3	1.3	0.09
24	6 40.6	2 56 21.51	14 56 26.3	0.3	1.3	0.09	9	16 0.1	3 16 18.48	16 17 51.2	0.3	1.3	0.09
25	6 36.6	2 56 21.32	+14 56 29.4	0.3	1.3	0.09	10	15 56.1	3 16 16.32	+16 17 39.5	0.3	1.3	0.09
26	6 32.7	2 56 21.27	14 56 33.1	0.3	1.3	0.09	11	15 52.1	3 16 14.04	16 17 27.4	0.3	1.3	0.09
27	6 28.8	2 56 21.36	14 56 37.3	0.3	1.3	0.09	12	15 48.2	3 16 11.64	16 17 14.9	0.3	1.3	0.09
28	6 24.8	2 56 21.59	14 56 42.2	0.3	1.3	0.09	13	15 44.2	3 16 9.12	16 17 1.8	0.3	1.3	0.09
29	6 20.9	2 56 21.95	14 56 47.7	0.3	1.3	0.09	14	15 40.2	3 16 6.47	16 16 48.3	0.3	1.3	0.09
30	6 17.0	2 56 22.45	+14 56 53.8	0.3	1.3	0 09	15	15 36.2	3 16 3.70	+16 16 34.3	0.3	1.3	0.09
31	6 13.1	2 56 23.09	14 57 0.5	0.3	1.3	0.09	16	15 32.2	3 16 0.81	16 16 19.9	0.3	1.3	0.09
Feb. 1	6 9.1	2 56 23 87	14 57 7.9	0.3	1.3	0.09	17	15 28.3	3 15 57.80	16 16 5.1	0.3	1.3	0.09
2	6 5.2	2 56 24.79	14 57 15.8	0.3	1.3	0.09	18	15 24.3	3 15 54.67	16 15 49.8	0.3	1.3	0.09
3	6 1.3	2 56 25.84	14 57 24.2	0.3	1.3	0.09	19	15 20.3	3 15 51.43	16 15 34.0	0.3	1.3	0.09
4	5 57.4	2 56 27.03	+14 57 33.2	0.3	1.3	0.09	20	15 16.3	3 15 48.07	+16 15 17.9	0.3	1.3	0.09
5	5 53.5	2 56 28.36	14 57 42.8	0.3	1.3	0.09	21	15 12.3	3 15 44.60	16 15 1.5	0.3	1.3	0.09
6	5 49.6	2 56 29.82	14 57 53.0	0.3	1.3	0.09	22	15 8.3	3 15 41.01	16 14 44.6	0.3	1.3	0.09
7	5 45.7	2 56 31.42	14 58 3.9	0.3	1.3	0.09	23	15 4.3	3 15 37.31	16 14 27.3	0.3	1.3	0.09
8	5 41.8	2 56 33.16	14 58 15.3	0.3	1.3	0.09	24	15 0.3	3 15 33.50	16 14 9.6	0.3	1.3	0.09
9	5 37.9	2 56 35.04	+14 58 27.3	0.3	1.3	0.09	25	14 56.3	3 15 29.58	+16 13 51.5	0.3	1.3	0.09
10	5 34.0	2 56 37.05	14 58 39.9	0.3	1.3	0.09	26	14 52.3	3 15 25.56	16 13 33.0	0.3	1.3	0.09
11	5 30.1	2 56 39.18	14 58 53.0	0.3	1.3	0.09	27	14 48.3	3 15 21.44	16 13 14.2	0.3	1.3	0.09
12	5 26.2	2 56 41.45	14 59 6.7	0.3	1.3	0.09	28	14 44.3	3 15 17.21	16 12 55.0	0.3	1.3	0.09
13	5 22.3	2 56 43.86	14 59 20.9	0.3	1.3	0.09	29	14 40.3	3 15 12.88	16 12 35.4	0.3	1.3	0.09
14	5 18.4	2 56 46.41	+14 59 35.8	0.3	1.3	0.09	30	14 36.3	3 15 8.44	+16 12 15.4	0.3	1.3	0.09
15	5 14.5	2 56 49.08	+14 59 51.2	0.3	1.3	0.09	31	14 32.3	3 15 3.90	+16 11 55.1	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	14 32.3	3 15 3.90	+16 11 55.1	0.3	1.3	0.09	Nov. 16	11 26.8	3 10 23.74	+15 52 32.8	0.3	1.3	0.09
2	14 28.3	3 14 59.26	16 11 34.5	0.3	1.3	0.09	17	11 22.8	3 10 17.01	15 52 6.3	0.3	1.3	0.09
3	14 24.3	3 14 54.53	16 11 13.5	0.3	1.3	0.09	18	11 18.7	3 10 10.29	15 51 40.0	0.3	1.3	0.09
4	14 20.3	3 14 49.71	16 10 52.2	0.3	1.3	0.09	19	11 14.7	3 10 3.59	15 51 13.7	0.3	1.3	0.09
5	14 16.3	3 14 44.80	16 10 30.7	0.3	1.3	0.09	20	11 10.6	3 9 56.91	15 50 47.5	0.3	1.3	0.09
6	14 12.3	3 14 39.80	+16 10 8.9	0.3	1.3	0.09	21	11 6.6	3 9 50.26	+15 50 21.4	0.3	1.3	0.09
7	14 8.3	3 14 34.70	16 9 46.7	0.3	1.3	0.09	22	11 2.6	3 9 43.63	15 49 55.5	0.3	1.3	0.09
8	14 4.3	3 14 29.51	16 9 24.1	0.3	1.3	0.09	23	10 58.5	3 9 37.02	15 49 29.8	0.3	1.3	0.09
9	14 0.2	3 14 24.23	16 9 1.3	0.3	1.3	0.09	24	10 54.5	3 9 30.45	15 49 4.3	0.3	1.3	0.09
10	13 56.2	3 14 18.88	16 8 38.4	0.3	1.3	0.09	25	10 50.4	3 9 23.91	15 48 39.1	0.3	1.3	0.09
11	13 52.2	3 14 13.45	+16 8 15.2	0.3	1.3	0.09	26	10 46.4	3 9 17.41	+15 48 14.1	0.3	1.3	0.09
12	13 48.1	3 14 7.94	16 7 51.7	0.3	1.3	0.09	27	10 42.3	3 9 10.95	15 47 49.2	0.3	1.3	0.09
13	13 44.1	3 14 2.35	16 7 27.7	0.3	1.3	0.09	28	10 38.3	3 9 4.53	15 47 24.5	0.3	1.3	0.09
14	13 40.1	3 13 56.68	16 7 3.4	0.3	1.3	0.09	29	10 34.3	3 8 58.16	15 47 0.0	0.3	1.3	0.09
15	13 36.1	3 13 50.95	16 6 38.9	0.3	1.3	0.09	30	10 30.2	3 8 51.84	15 46 35.8	0.3	1.3	0.09
16	13 32.0	3 13 45.15	+16 6 14.3	0.3	1.3	0.09	Dec. 1	10 26.2	3 8 45.56	+15 46 11.8	0.3	1.3	0.09
17	13 28.0	3 13 39.28	16 5 49.4	0.3	1.3	0.09	2	10 22.2	3 8 39.33	15 45 48.1	0.3	1.3	0.09
18	13 24.0	3 13 33.34	16 5 24.4	0.3	1.3	0.09	3	10 18.1	3 8 33.16	15 45 24.6	0.3	1.3	0.09
19	13 20 0	3 13 27.33	16 4 59.2	0.3	1.3	0.09	4	10 14.1	3 8 27.05	15 45 1.4	0.3	1.3	0.09
20	13 15.9	3 13 21.27	16 4 33.8	0.3	1.3	0.09	5	10 10.1	3 8 21.00	15 44 38.5	0.3	1.3	0.09
21	13 11.9	3 13 15.16	+16 4 8.2	0.3	1.3	0.09	6	10 6.0	3 8 15.01	+15 44 16.0	0.3	1.3	0.09
22	13 7.9	3 13 9.00	16 3 42.5	0.3	1.3	0.09	7	10 2.0	3 8 9.08	15 43 53.8	0.3	1.3	0.09
23	13 3.8	3 13 2.78	16 3 16.7	0.3	1.3	0.09	8	9 58.0	3 8 3.21	15 43 31.9	0.3	1.3	0.09
24	12 59.8	3 12 56.50	16 2 50.7	0.3	1.3	0.09	9	9 53.9	3 7 57.41	15 43 10.3	0.3	1.3	0.09
25	12 55.7	3 12 50.16	16 2 24.5	0.3	1.3	0.09	10	9 49.9	3 7 51.68	15 42 49.1	0.3	1.3	0.09
26	12 51.7	3 12 43.78	+16 1 58.0	0.3	1.3	0.09	11	9 45.9	3 7 46.03	+15 42 28.3	0.3	1.3	0.09
27	12 47.7	3 12 37.35	16 1 31.6	0.3	1.3	0.09	12	9 41.9	3 7 40.46	15 42 7.8	0.3	1.3	0.09
28	12 43.6	3 12 30.88	16 1 5.0	0.3	1.3	0.09	13	9 37.8	3 7 34.97	15 41 47.7	0.3	1.3	0.09
29	12 39.6	3 12 24.38	16 0 38.3	0.3	1.3	0.09	14	9 33.8	3 7 29.56	15 41 28.0	0.3	1.3	0.09
30	12 35.5	3 12 17.85	16 0 11.5	0.3	1.3	0.09	15	9 29.8	3 7 24.23	15 41 8.7	0.3	1.3	0.09
31	12 31.5	3 12 11.29	+15 59 44 6	0.3	1.3	0.09	16	9 25.8	3 7 18.99	+15 40 49.7	0.3	1.3	0.09
Nov. 1	12 27.5	3 12 4.69	15 59 17.7	0.3	1.3	0.09	17	9 21.8	3 7 13.83	15 40 31.1	0.3	1.3	0.09
2	12 23.4	3 11 58.06	15 58 50.8	0.3	1.3	0.09	18	9 17.7	3 7 8.76	15 40 13.0	0.3	1.3	0.09
3	12 19.4	3 11 51.40	15 58 23.8	0.3	1.3	0.09	19	9 13.7	3 7 3.79	15 39 55.4	0.3	1.3	0.09
4	12 15.3	3 11 44.72	15 57 56.7	0.3	1.3	0.09	20	9 9.7	3 6 58.91	15 39 38.2	0.3	1.3	0.09
5	12 11.3	3 11 38.02	+15 57 29.6	0.3	1.3	0.09	21	9 5.7	3 6 54.13	+15 39 21.4	0.3	1.3	0.09
6	12 7.3	3 11 31.31	15 57 2.5	0.3	1.3	0.09	22	9 1.7	3 6 49.44	15 39 5.0	0.3	1.3	0.09
7	12 3.2	3 11 24.58	15 56 35.3	0.3	1.3	0.09	23	8 57.7	3 6 44.85	15 38 49.0	0.3	1.3	0.09
8	11 59.2	3 11 17.83	15 56 8.2	0.3	1.3	0.09	24	8 53.7	3 6 40.36	15 38 33.4	0.3	1.3	0.09
9	11 55.1	3 11 11.07	15 55 41.1	0.3	1.3	0.09	25	8 49.7	3 6 35.98	15 38 18.2	0.3	1.3	0.09
10	11 51.1	3 11 4.31	+15 55 14.1	0.3	1.3	0.09	26	8 45.7	3 6 31.70	+15 38 3.5	0.3	1.3	0.09
11	11 47.0	3 10 57.54	15 54 47.1	0.3	1.3	0.09	27	8 41.7	3 6 27.52	15 37 49.3	0.3	1.3	0.09
12	11 43.0	3 10 50.76	15 54 20.3	0.3	1.3	0.09	28	8 37.7	3 6 23.45	15 37 35.6	0.3	1.3	0.09
13	11 38.9	3 10 43.99	15 53 53.4	0.3	1.3	0.09	29	8 33.7	3 6 19.49	15 37 22.4	0.3	1.3	0.09
14	11 34.9	3 10 37.24	15 53 26.5	0.3	1.3	0.09	30	8 29.7	3 6 15.64	15 37 9.7	0.3	1.3	0.09
15	11 30.8	3 10 30.49	+15 52 59.6	0.3	1.3	0.09	31	8 25.7	3 6 11.91	+15 36 57.6	0.3	1.3	0.09
16	11 26.8	3 10 23.74	+15 52 32.8	0.3	1.3	0.09	32	8 21.7	3 6 8.29	+15 36 46.1	0.3	1.3	0.09

PHENOMENA

ECLIPSES IN 1883.

In the year 1883 there will be four eclipses, two of the sun and two of the moon.

I.—A partial eclipse of the moon, 1883, April 21–22, invisible at Washington, but visible on the Pacific Coast, the Pacific Ocean and Asia.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, April 22ᵈ 0ʰ 7ᵐ 31ˢ.4

	h m s		s
Sun's right ascension	1 59 18.76	Hourly motion	9.35
Moon's right ascension	13 59 18.76	Hourly motion	118.03
	° ′ ″		′ ″
Sun's declination	12 10 37.1 N.	Hourly motion	0 49.9 N.
Moon's declination	13 3 27.8 S.	Hourly motion	7 42.5 S.
Sun's equa. hor. parallax	8.8	Sun's true semidiameter	15 56.5
Moon's equa. hor. parallax	54 6.5	Moon's true semidiameter	14 44.0

TIMES OF PHASES.

		d	h	m	
Moon enters penumbra	April	21	21	5.4	Greenwich mean time.
Moon enters shadow		21	23	1.3	
Middle of the eclipse		21	23	38.5	
Moon leaves shadow		22	0	15.1	
Moon leaves penumbra		22	2	11.9	

CIRCUMSTANCES OF THE ECLIPSE.

First contact of shadow with the moon's limb 33° from the north point toward the east, when the moon is in the zenith in longitude 166° 8′ west from Greenwich, and latitude 12° 55′ south.

Last contact of shadow with the moon's limb 4° from the north point toward the west, when the moon is in the zenith in longitude 175° 50′ east from Greenwich, and latitude 13° 4′ south.

Magnitude of the eclipse = 0.086, (moon's diameter = 1).

II.—A total eclipse of the sun, 1883, May 6, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, May 6ᵈ 9ʰ 45ᵐ 12ˢ.7

	h m s		s s
Sun and moon's R. A.	2 54 3.41	Hourly motions	9.67 and 153.41
	° ′ ″		′ ″
Sun's declination	16 37 52.2 N.	Hourly motion	0 41.9 N.
Moon's declination	16 11 31.0 N.	Hourly motion	7 29.5 N.
Sun's equa. hor. parallax	8.8	Sun's true semidiameter	15 53.0
Moon's equa. hor. parallax	60 53.3	Moon's true semidiameter	16 34.7

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m		° ′		° ′
Eclipse begins	May	6	7	21.3	in long.	167 13.5 E.	and in lat.	26 10.5 S.
Central eclipse begins		6	8	20.2		156 0.6 E.		34 45.9 S.
Central eclipse at noon		6	9	45.2		147 11.4 W.		9 7.8 S.
Central eclipse ends		6	11	27.6		86 56.3 W.		13 33.3 S.
Eclipse ends		6	12	26.6		98 59.5 W.		4 50.1 S.

III.—A partial eclipse of the moon, 1883, October 15, visible at Washington, throughout the United States, and on the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, October $15^{\mathrm{d}}\ 19^{\mathrm{h}}\ 20^{\mathrm{m}}\ 31^{\mathrm{s}}.3$

Sun's right ascension	13h 23m 34s.72	Hourly motion	9s.32
Moon's right ascension	1 23 34.72	Hourly motion	148.36
Sun's declination	8° 47′ 43″.1 S.	Hourly motion	0′ 55″.4 S.
Moon's declination	9 43 30.8 N.	Hourly motion	10 54.6 N.
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 5.5
Moon's equa. hor. parallax	61 22.4	Moon's true semidiameter	16 42.7

TIMES OF PHASES.

		d	h	m	
Moon enters penumbra	October	15	16	40.3	Greenwich mean time.
Moon enters shadow		15	17	58.4	
Middle of the eclipse		15	18	54.2	
Moon leaves shadow		15	19	50.0	
Moon leaves penumbra		15	21	8.4	

CIRCUMSTANCES OF THE ECLIPSE.

First contact of shadow with the moon's limb 132° from the north point toward the east, when the moon is in the zenith in longitude 93° 55′ west from Greenwich, and latitude 9° 29′ north.

Last contact of shadow with the moon's limb 165° from the north point toward the west, when the moon is in the zenith in longitude 120° 50′ west from Greenwich, and latitude 9° 49′ north.

Magnitude of the eclipse = 0.280, (moon's diameter = 1).

IV.—An annular eclipse of the sun, 1883, October 30, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, October $30^{\mathrm{d}}\ 11^{\mathrm{h}}\ 36^{\mathrm{m}}\ 44^{\mathrm{s}}.6$

Sun and moon's R. A.	14h 19m 29s.71	Hourly motions	9s.75 and 118s.16
Sun's declination	13° 55′ 51″.2 S.	Hourly motion	0′ 49″.0 S.
Moon's declination	13 28 3.5 S.	Hourly motion	7 2.7 S.
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 9.4
Moon's equa. hor. parallax	53 56.0	Moon's true semidiameter	14 41.1

CIRCUMSTANCES OF THE ECLIPSE.

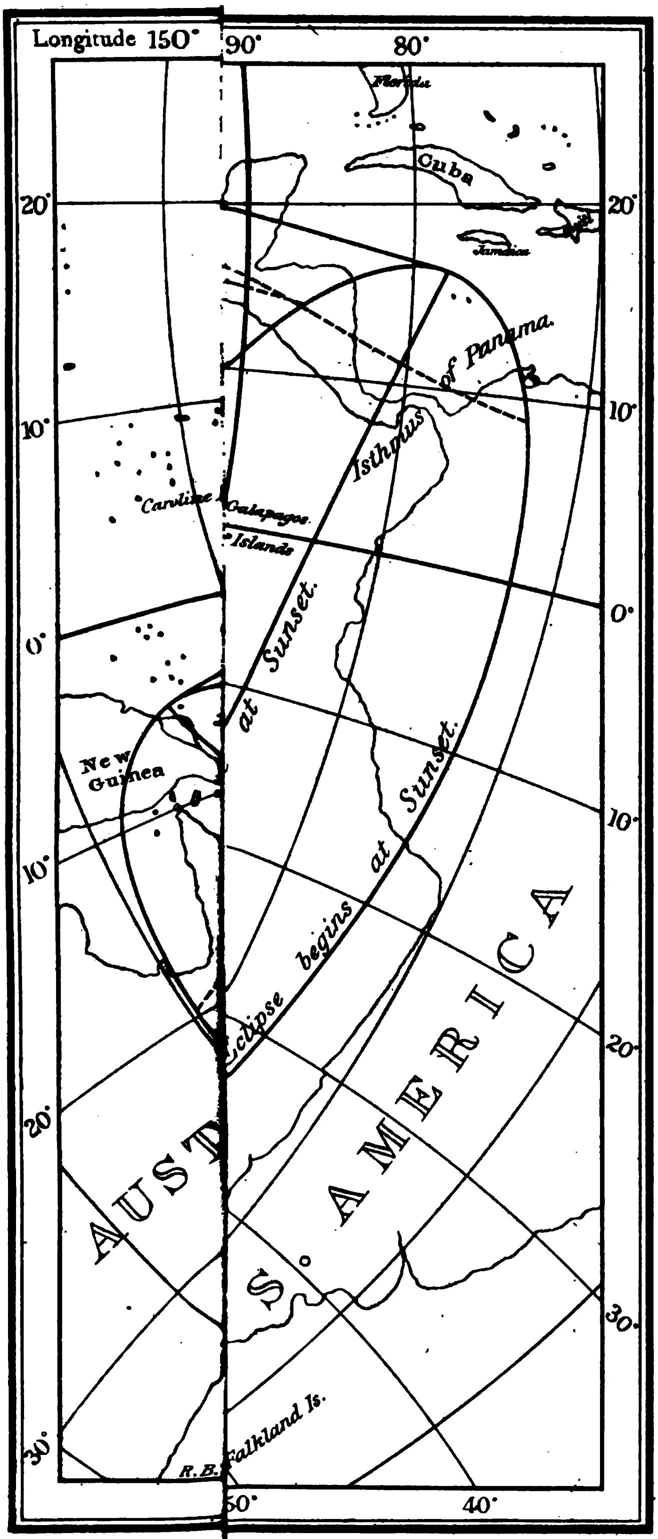
		d h m				
Eclipse begins	October	30 8 53.3	in long.	141° 11′.4 E.	and in lat.	31° 5′.2 N.
Central eclipse begins		30 10 8.1		126 51.3 E.		42 8.2 N.
Central eclipse at noon		30 11 36.7		178 14.8 W.		17 18.2 N.
Central eclipse ends		30 13 33.9		121 45.1 W.		16 29.8 N.
Eclipse ends		30 14 48.4		137 29.2 W.		5 15.7 N.

The regions within which the eclipses of the sun are visible are laid down on the following charts, from which may also be found the Greenwich time of beginning or ending within fifteen or twenty minutes, by means of the dotted lines.

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, 1883, MAY 6.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	*y*	Sin *d.*	Cos *d.*	*μ*	*l*	*l′*
h m					° ′		
7 20	−1.37482	−0.70461	+9.45601	+9.98150	110 52.9	+0.53356	−0.01225
7 30	1.28017	0.68592	9.45606	9.98150	113 22.9	0.53358	0.01223
7 40	1.18552	0.66724	9.45611	9.98149	115 53.0	0.53360	0.01221
7 50	1.09086	0.64856	9.45616	9.98149	118 23.0	0.53362	0.01219
8 0	0.99620	0.62989	9.45620	9.98148	120 53.0	0.53364	0.01217
8 10	−0.90153	−0.61122	+9.45625	+9.98148	123 23.0	+0.53366	−0.01215
8 20	0.80686	0.59255	9.45630	9.98148	125 53.0	0.53368	0.01214
8 30	0.71219	0.57389	9.45635	9.98147	128 23.1	0.53369	0.01213
8 40	0.61751	0.55523	9.45640	9.98147	130 53.1	0.53371	0.01211
8 50	0.52283	0.53658	9.45644	9.98146	133 23.1	0.53372	0.01210
9 0	−0.42815	−0.51793	+9.45649	+9 98146	135 53.1	+0.53373	−0.01208
9 10	0.33346	0.49928	9.45654	9.98145	138 23.2	0.53374	0.01207
9 20	0.23877	0.48064	9.45659	9.98145	140 53.2	0.53376	0.01206
9 30	0.14408	0.46201	9.45664	9.98145	143 23.2	0.53377	0.01205
9 40	−0.04939	0.44338	9.45669	9.98144	145 53.2	0.53378	0.01204
9 50	+0.04530	−0.42476	+9.45673	+9.98144	148 23.2	+0.53379	−0.01203
10 0	0.13998	0.40614	9.45678	9.98143	150 53.3	0.53380	0.01202
10 10	0.23467	0.38752	9.45683	9.98143	153 23.3	0.53381	0.01201
10 20	0.32936	0.36892	9.45688	9.98142	155 53.3	0.53381	0.01200
10 30	0.42405	0.35031	9.45693	9.98142	158 23.3	0.53382	0.01199
10 40	+0.51873	−0.33171	+9.45697	+9.98142	160 53.4	+0.53383	−0.01199
10 50	0.61342	0.31312	9.45702	9.98141	163 23.4	0.53383	0.01198
11 0	0.70810	0.29454	9.45707	9.98141	165 53.4	0.53384	0.01198
11 10	0.80279	0.27596	9.45712	9.98140	168 23.4	0.53384	0.01197
11 20	0.89747	0.25738	9.45717	9.98140	170 53.4	0.53385	0.01197
11 30	+0.99215	−0.23881	+9.45721	+9.98140	173 23.5	+0.53385	−0.01197
11 40	1.08683	0.22025	9.45726	9.98139	175 53.5	0.53385	0.01196
11 50	1.18150	0.20169	9.45731	9.98139	178 23.5	0.53385	0.01196
12 0	1.27618	0.18314	9.45736	9.98138	180 53.5	0.53385	0.01196
12 10	1.37085	0.16460	9.45741	9.98138	183 23.5	0.53386	0.01196
12 20	+1.46552	−0.14606	+9.45745	+9.98137	185 53.6	+0.53386	−0.01195

Greenwich Mean Time.	Log Δ *x* for 1 Minute.	Log Δ *y* for 1 Minute.	Log Δ *μ* for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h m					
7 0	+7.9761	+7.2717	+1.1761	7.66575	7.66364
8 0	7.9762	7.2712	1.1761	7.66575	7.66363
9 0	7.9763	7.2706	1.1761	7.66574	7.66363
10 0	7.9763	7.2699	1.1761	7.66574	7.66362
11 0	7.9763	7.2691	1.1761	7.66573	7.66361
12 0	+7.9762	+7.2683	+1.1761	7.66573	7.66361


Longitude 150°
90°
80°
Florida
Cuba
Jamaica
20°
20°
Isthmus of Panama.
10°
10°
Caroline
Galapagos
Islands
at Sunset.
0°
0°
New Guinea
10°
10°
Eclipse begins at Sunset.
20°
20°
AUST
S. AMERICA
30°
30°
Falkland Is.
R.B.
50°
40°

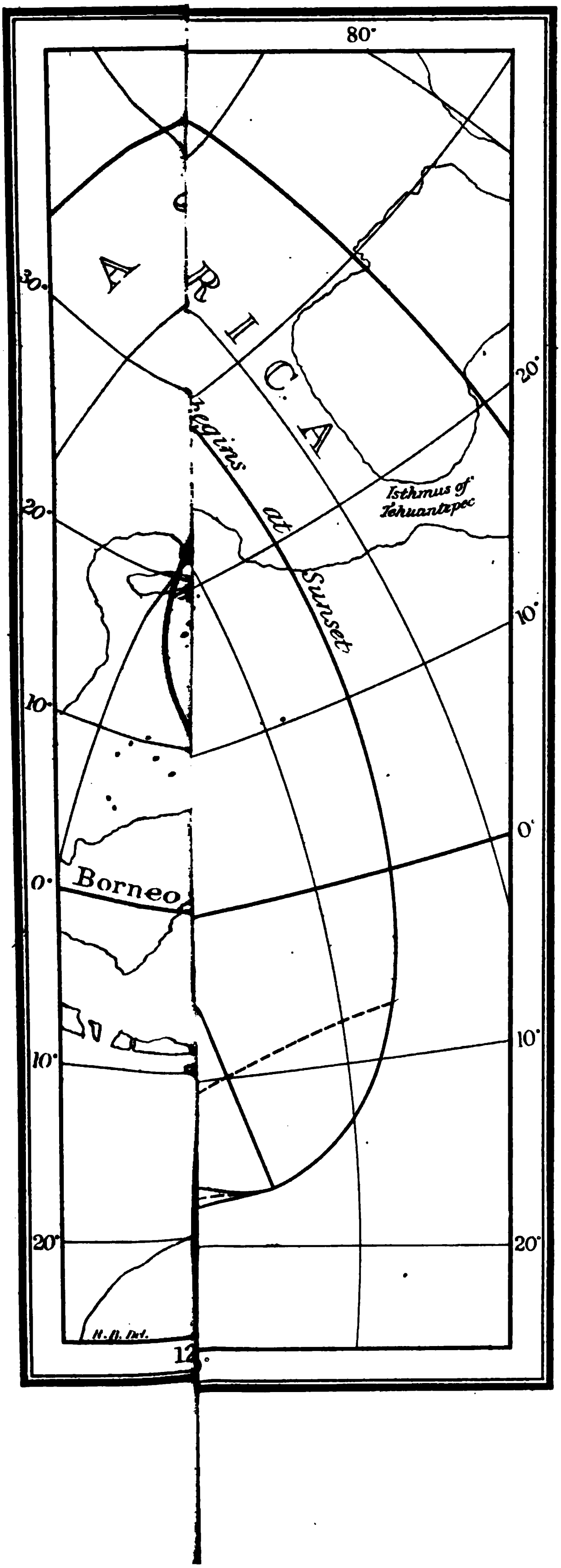
PATH OF SHADOW DURING THE TOTAL ECLIPSE OF THE SUN, 1883, MAY 6.

Greenwich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits	−34 0.7	155 48.6 E.	−34 45.9	156 0.6 E.	−35 26.5	156 14.5 E.	
8^{h} 25^{m}	27 40.5	173 19.6	28 41.4	172 58.0	29 42.3	172 36.5	3 19.9
8 30	24 57.9	179 22.5 E.	25 56.2	179 17.6 E.	26 54.5	179 12.6 E.	3 40.7
8 35	22 52.4	176 15.6 W.	23 49.2	176 12.8 W.	24 46.0	176 10.1 W.	3 57.5
8 40	21 6.1	172 45.3	22 2.3	172 38.0	22 58.5	172 30.7	4 12.2
8 45	−19 32.8	169 46.8	−20 28.7	169 36.4	−21 24.5	169 26.0	4 25.4
8 50	18 9.0	167 10.2	19 4.7	166 57.6	20 0.5	166 45.0	4 37.5
8 55	16 53.0	164 49.5	17 48.4	164 35.2	18 44.6	164 20.8	4 48.6
9 0	15 42.5	162 40.8	16 38.3	162 25.1	17 34.2	162 9.5	4 58.8
9 5	14 37.5	160 41.5	15 33.5	160 24.9	16 29.6	160 8.2	5 8.2
9 10	−13 37.0	158 49.5	−14 33.2	158 32.1	−15 29.5	158 14.6	5 16.7
9 15	12 40.6	157 3.3	13 37.0	156 45.3	14 33.5	156 27.2	5 24.4
9 20	11 47.8	155 21.7	12 44.6	155 3.2	13 41.3	154 44.8	5 31.4
9 25	10 58.5	153 43.8	11 55.5	153 25.0	12 52.6	153 6.2	5 37.4
9 30	10 12.3	152 8.8	11 9.6	151 49.8	12 7.0	151 30.8	5 42.6
9 35	− 9 29.2	150 36.0	−10 26.7	150 16.9	−11 24.3	149 57.7	5 47.0
9 40	8 48.8	149 4.7	9 46.7	148 45.6	10 44.5	148 26.4	5 50.5
9 45	8 11.2	147 34.4	9 9.3	147 15.3	10 7.5	146 56.2	5 53.1
9 50	7 36.4	146 4.7	8 34.7	145 45.7	9 33.1	145 26.7	5 54.8
9 55	7 4.2	144 34.9	8 2.8	144 16.1	9 1.4	143 57.3	5 55.5
10 0	− 6 34.6	143 4.8	− 7 33.4	142 46.2	− 8 32.2	142 27.6	5 55.2
10 5	6 7.7	141 33.8	7 6.7	141 15.5	8 5.7	140 57.1	5 54.0
10 10	5 43.4	140 1.4	6 42 6	139 43.4	7 41.7	139 25.3	5 51.8
10 15	5 22.0	138 27.1	6 21.2	138 9.3	7 20.5	137 51.6	5 48.6
10 20	5 3.4	136 50.3	6 2.7	136 32.8	7 1.9	136 15.4	5 44.4
10 25	− 4 47.8	135 10.5	− 5 47.0	134 53.4	− 6 46.3	134 36.3	5 39.2
10 30	4 35.2	133 27.1	5 34.4	133 10.3	6 33.7	132 53.5	5 33.0
10 35	4 25.9	131 39.2	5 25.1	131 22.6	6 24.3	131 6.1	5 25.9
10 40	4 20.3	129 45.9	5 19.4	129 29.5	6 18.4	129 13.2	5 17.8
10 45	4 18.7	127 45.8	5 17.5	127 29.6	6 16.4	127 13.4	5 8.7
10 50	− 4 21.4	125 37.8	− 5 20.0	125 21.6	− 6 18.6	125 5.4	4 58.7
10 55	4 29.1	123 19.7	5 27.5	123 3.3	6 25.9	122 47.0	4 47.5
11 0	4 42.9	120 48.4	5 41.0	120 31.6	6 39.1	120 14.7	4 35.6
11 5	5 4.0	118 0.1	6 1.7	117 42.5	6 59.5	117 24.7	4 22.3
11 10	5 34.3	114 48.8	6 31.8	114 29.4	7 29.3	114 10.1	4 7.8
11 15	− 6 17.7	111 2.4	− 7 15.2	110 40.0	− 8 12.6	110 17.6	3 51.4
11 20	7 22.1	106 17.0	8 20.1	105 48.0	9 18.1	105 19.0	3 32.4
11 25	9 11.0	99 16.6	10 14.0	98 24.5	11 17.0	97 32.4	3 7.2
Limits	−12 48.6	86 48.6 W.	−13 33.3	86 56.3 W.	−14 16.3	87 3.5 W.	

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1883, OCTOBER 30.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Sin d.	Cos d.	μ	l	l'
h m					° ′		
8 50	−1.36173	+0.83892	−9.38048	+9.98710	136 33.5	+0.57258	+0.02657
9 0	1.28009	0.81958	9.38054	9.98710	139 3.5	0.57259	0.02658
9 10	1.19844	0.80024	9.38060	9.98709	141 33.5	0.57259	0.02659
9 20	1.11680	0.78090	9.38067	9.98709	144 3.5	0.57260	0.02660
9 30	1.03515	0.76156	9.38074	9.98708	146 33.6	0.57260	0.02661
9 40	−0.95350	+0.74223	−9.38081	+9.98708	149 3.6	+0.57261	+0.02662
9 50	0.87184	0.72290	9.38088	9.98707	151 33.6	0.57262	0.02663
10 0	0.79018	0.70357	9.38095	9.98707	154 3.6	0.57263	0.02663
10 10	0.70851	0.68425	9.38101	9.98707	156 33.6	0.57263	0.02664
10 20	0.62684	0.66493	9.38108	9.98706	159 3.6	0.57264	0.02664
10 30	−0.54517	+0.64562	−9.38115	+9.98706	161 33.7	+0.57264	+0.02665
10 40	0.46350	0.62631	9.38122	9.98706	164 3.7	0.57265	0.02665
10 50	0.38183	0.60700	9.38129	9.98705	166 33.7	0.57265	0.02666
11 0	0.30016	0.58769	9.38136	9.98705	169 3.7	0.57266	0.02666
11 10	0.21848	0.56839	9.38142	9.98704	171 33.7	0.57266	0.02666
11 20	−0.13681	+0.54909	−9.38149	+9.98704	174 3.7	+0.57266	+0.02666
11 30	−0.05513	0.52979	9.38156	9.98703	176 33.8	0.57267	0.02667
11 40	+0.02654	0.51050	9.38163	9.98703	179 3.8	0.57267	0.02667
11 50	0.10821	0.49121	9.38170	9.98702	181 33.8	0.57267	0.02667
12 0	0.18989	0.47192	9.38176	9.98702	184 3.8	0.57267	0.02667
12 10	+0.27157	+0.45264	−9.38183	+9.98701	186 33.8	+0.57267	+0.02667
12 20	0.35325	0.43336	9.38190	9.98701	189 3.8	0.57267	0.02667
12 30	0.43494	0.41408	9.38197	9.98701	191 33.9	0.57266	0.02666
12 40	0.51662	0.39480	9.38204	9.98700	194 3.9	0.57266	0.02666
12 50	0.59830	0.37553	9.38211	9.98700	196 33.9	0.57266	0.02666
13 0	+0.67998	+0.35626	−9.38217	+9.98700	199 3.9	+0.57266	+0.02666
13 10	0.76166	0.33700	9.38224	9.98699	201 33.9	0.57265	0.02665
13 20	0.84334	0.31774	9.38231	9.98699	204 3.9	0.57265	0.02665
13 30	0.92503	0.29848	9.38238	9.98698	206 34.0	0.57264	0.02664
13 40	1.00671	0.27923	9.38245	9.98698	209 4.0	0.57264	0.02664
13 50	+1.08840	+0.25998	−9.38252	+9.98697	211 34.0	+0.57263	+0.02663
14 0	1.17008	0.24073	9.38258	9.98697	214 4.0	0.57263	0.02663
14 10	1.25176	0.22150	9.38265	9.98696	216 34.0	0.57262	0.02662
14 20	1.33344	0.20227	9.38272	9.98696	219 4.0	0.57262	0.02662
14 30	1.41512	0.18304	9.38279	9.98695	221 34.1	0.57261	0.02661
14 40	+1.49680	+0.16381	−9.38286	+9.98695	224 4.1	+0.57260	+0.02661
14 50	+1.57848	+0.14459	−9.38293	+9.98695	226 34.1	+0.57259	+0.02660

Greenwich Mean Time.	Log Δ x for 1 Minute.	Log Δ y for 1 Minute.	Log Δ μ for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h					
9	+ 7.9119	− 7.2866	+ 1.1761	7.67326	7.67115
10	7.9120	7.2861	1.1761	7.67327	7.67115
11	7.9121	7.2857	1.1761	7.67327	7.67116
12	7.9121	7.2852	1.1761	7.67328	7.67116
13	7.9121	7.2848	1.1761	7.67328	7.67117
14	+ 7.9121	− 7.2843	+ 1.1761	7.67329	7.67117


80°
A R I C A
egins at Sunset
Isthmus of Tehuantepec
Borneo
30°
20°
10°
0°
10°
20°
20°
10°
0°
10°
20°
H.B. Del.
12

PATH OF ANNULUS DURING THE ANNULAR ECLIPSE OF THE SUN, 1883, OCTOBER 30.

Greenwich Mean Time.	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits	+43 45.6	127 17.1 E.	+42 8.2	126 51.3 E.	+40 24.9	126 29.3 E.	
10h 10m	41 39.6	134 52.4	38 53.5	138 3.3	36 7.4	141 14.2	7 6.5
10 15	37 45.3	146 5.1	35 40.5	147 0.1	33 35.8	147 55.1	7 31.2
10 20	35 19.9	151 56.9	33 28.1	152 17.3	31 36.4	152 37.8	7 49.2
10 25	33 23.9	156 10.3	31 39.6	156 13.9	29 55.3	156 17.4	8 4.6
10 30	+31 44.4	159 32.2	+30 5.3	159 25.4	+28 26.1	159 18.7	8 18.4
10 35	30 16.1	162 21.5	28 40.8	162 7.8	27 5.5	161 54.1	8 31.0
10 40	28 56.2	164 48.2	27 23.8	164 29.6	25 51.4	164 11.0	8 42.8
10 45	27 42.7	166 58.3	26 12.6	166 36.0	24 42.5	166 13.6	8 54.0
10 50	26 34.4	168 56.0	25 6.2	168 30.9	23 38.0	168 5.7	9 4.5
10 55	+25 30.7	170 43.8	+24 4.0	170 16.4	+22 37.3	169 49.0	9 14.4
11 0	24 30.9	172 23.4	23 5.4	171 54.2	21 40.0	171 25.1	9 23.6
11 5	23 34.5	173 56.6	22 10.1	173 26.0	20 45.7	172 55.5	9 32.1
11 10	22 41.4	175 24.7	21 17.7	174 52.9	19 54.1	174 21.2	9 40.0
11 15	21 50.9	176 48.4	20 27.9	176 15.7	19 4.9	175 43.0	9 47.1
11 20	+21 3.1	178 8.7	+19 40.5	177 35.2	+18 18.0	177 1.7	9 53.6
11 25	20 17.8	179 26.1 E.	18 55.5	178 52.0 E.	17 33.2	178 17.8	9 59.5
11 30	19 34.8	179 18.6 W.	18 12.7	179 53.3 W.	16 50.6	179 32.0 E.	10 4.8
11 35	18 54.0	178 5.1	17 31.9	178 40.3	16 9.8	179 15.5 W.	10 9.1
11 40	18 15.3	176 52.9	16 53.1	177 28.5	15 31.0	178 4.0	10 12.6
11 45	+17 38.6	175 41.5	+16 16.3	176 17.4	+14 54.0	176 53.3	10 15.2
11 50	17 3.8	174 30.6	15 41.3	175 6.7	14 18.8	175 42.8	10 17.0
11 55	16 31.0	173 19.6	15 8.2	173 56.0	13 45.4	174 32.4	10 17.9
12 0	16 0.2	172 8.3	14 37.0	172 44.9	13 13.8	173 21.5	10 18.0
12 5	15 31.3	170 56.4	14 7.6	171 33.1	12 43.9	172 9.9	10 17.1
12 10	+15 4.3	169 43.3	+13 40.1	170 20.2	+12 15.8	170 57.2	10 15.2
12 15	14 39.3	168 28.7	13 14.4	169 5.9	11 49.6	169 43.0	10 12.3
12 20	14 16.3	167 12.1	12 50.8	167 49.5	11 25.3	168 26.9	10 8.4
12 25	13 55.3	165 53.1	12 29.1	166 30.8	11 2.8	167 8.5	10 3.7
12 30	13 36.6	164 31.0	12 9.5	165 9.0	10 42.5	165 47.0	9 58.0
12 35	+13 20.1	163 5.3	+11 52.2	163 43.8	+10 24.2	164 22.3	9 51.2
12 40	13 6.1	161 35.2	11 37.2	162 14.3	10 8.3	162 53.4	9 43.3
12 45	12 54.8	159 59.8	11 24.8	160 39.6	9 54.8	161 19 5	9 34.5
12 50	12 46.3	158 17.9	11 15.2	158 58.8	9 44.1	159 39.7	9 24.7
12 55	12 41.3	156 27.9	11 8.9	157 10.2	9 36.4	157 52.5	9 14.0
13 0	+12 40.1	154 28.2	+11 6.1	155 12.5	+ 9 32.1	155 56.7	9 2.2
13 5	12 43.5	152 16.0	11 7.7	153 2.9	9 31.9	153 49.8	8 49.5
13 10	12 52.4	149 46.8	11 14.5	150 37.6	9 36.5	151 28.4	8 35.8
13 15	13 8.8	146 54.8	11 28.0	147 51.4	9 47.1	148 48.0	8 21.0
13 20	13 35.5	143 28.3	11 50.7	144 34.4	10 6.0	145 40.6	8 4.2
13 25	+14 19.0	139 2.5	+12 27.8	140 26.8	+10 36.6	141 51.0	7 44.3
13 30	15 40.8	132 15.6	13 34.4	134 29.8	11 28.0	136 44.0	7 21.8
Limits	+18 13.8	121 50.3 W.	+16 29.8	121 45.1 W.	+14 47.5	121 39.0 W.	

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.				First Quarter.				Full Moon.				Last Quarter.			
	d	h	m		d	h	m		d	h	m		d	h	m
January	8	12	51.1	January	15	7	39.3	January	22	14	7.3	January	30	17	18.4
February	7	1	1.9	February	13	16	46.7	February	21	7	9.9	March	1	12	17.9
March	8	11	23.1	March	15	3	23.1	March	23	0	56.5	March	31	3	13.1
April	6	20	28.0	April	13	15	41.3	April	21	18	19.1	April	29	13	55.1
May	6	4	50.0	May	13	5	45.9	May	21	10	3.3	May	28	21	14.5
June	4	13	4.3	June	11	21	33.3	June	19	23	23.4	June	27	2	29.5
July	3	21	55.3	July	11	14	41.1	July	19	10	22.7	July	26	7	5.1
August	2	8	18.0	August	10	8	21.1	August	17	19	45.6	August	24	12	23.7
August	31	21	6.1	September	9	1	29.6	September	16	4	33.0	September	22	19	42.5
September	30	12	46.1	October	8	17	11.4	October	15	13	37.3	October	22	6	10.4
October	30	6	48.7	November	7	6	56.2	November	13	23	29.1	November	20	20	35.4
November	29	1	46.0	December	6	18	37.7	December	13	10	20.1	December	20	15	0.2
December	28	19	51.5												

APOGEE, PERIGEE, AND GREATEST LIBRATION.

Apogee.			Perigee.			Greatest Libration.									
	d	h		d	h		d	h	m			d	h	m	
January	28	1.8	January	12	3.7	January	6	6	24	E.	January	20	7	41	W.
February	24	17.4	February	8	21.8	February	3	3	56	E.	February	15	18	42	W.
March	23	23.2	March	9	6.1	March	3	4	44	E.	March	15	13	3	W.
April	20	1.2	April	6	16.8	March	31	15	15	E.	April	12	17	59	W.
May	17	11.7	May	5	3.3	April	28	18	40	E.	May	10	23	53	W.
June	14	4.0	June	2	6.6	May	26	3	27	E.	June	8	1	41	W.
July	11	22.3	June	29	15.2	June	21	12	42	E.	July	5	18	30	W.
August	8	17.0	July	24	19.5	July	18	5	41	E.	August	1	18	49	W.
September	5	10.7	August	20	14.1	August	14	18	15	E.	August	28	1	32	W.
October	3	0.9	September	17	14.1	September	11	18	23	E.	September	24	4	6	W.
October	30	3.9	October	15	23.5	October	10	0	27	E.	October	22	3	22	W.
November	26	7.7	November	13	11.7	November	7	7	28	E.	November	19	10	0	W.
December	23	22.2	December	11	22.4	December	5	7	27	E.	December	17	16	58	W.

FORMULÆ FOR THE LIBRATION OF THE MOON.

Put I, the inclination of the moon's equator to the ecliptic ($= 1^\circ\ 28'.8$),

☊, the mean longitude of the moon's ascending node, (see page 278), or the mean longitude of the descending node of the moon's equator,

C, the angle at the centre of the moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

λ, β, a', δ', the apparent longitude, latitude, right ascension, and declination of the moon, corrected for parallax,

λ', the selenocentric longitude of the earth, counted on the moon's equator from its descending node, ☊,

i, Δ, ☊$'$, ☾, the quantities defined on page 276, where their values for the year are given.

The moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 276 and 277: —

$$\left.\begin{aligned} \Delta\,\lambda &= -\,0'.57 \sin 2\,(☊ - \lambda) \\ a &= \sin I \cos\,(☊ - \lambda) \\ \tan B &= \tan I \sin\,(☊ - \lambda) \\ \lambda' &= \lambda + \Delta\,\lambda + a\,b \end{aligned}\right\}\ \textit{See table, page 277.}$$

$$\text{The libration in latitude} = b = B - \beta$$

$$\text{The libration in longitude} = l = \lambda' - ☾$$

$$\sin C = \sin i\,\frac{\cos\,(\lambda' + \Delta - ☊)}{\cos \delta'} = -\sin i\,\frac{\cos\,(a' - ☊')}{\cos b}$$

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. $\Delta\alpha$	Red'ns from 1883.0. $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
ψ Virginis	5	+0.87	− 2.4	− 8 54.2	1 2 53.0	+ 8 49.2	+0.5857	0.5169	−0.1752	+72	− 5
g Virginis	6	0.80	1.5	10 6.9	9 59.3	− 8 16.8	+0.6955	0.5192	0.1706	+80	+ 2
B. A. C. 4394	6	0.79.	2.1	8 21.4	10 20.5	− 7 56.3	−1.3047	0.5192	0.1706	−56	−90
50 Virginis	6	0.80	1.6	9 42.4	10 58.0	− 7 19.8	+0.0773	0.5194	0.1700	+38	−32
56 Virginis	6½	0.77	1.4	9 44.9	13 34.2	− 4 48.1	−0.3163	0.5205	0.1681	+16	−55
58 Virginis	6	+0.75	− 1.3	− 9 55.9	14 59.1	− 3 25.7	−0.3513	0.5208	−0.1671	+14	−58
62 Virginis	6½	0.74	1.0	10 41.4	16 28.5	− 1 59.0	+0.2370	0.5216	0.1658	+47	−23
α Virginis	1	0.71	0.9	10 33.0	18 59.2	+ 0 27.4	−0.3307	0.5224	0.1641	+15	−57
i Virginis	6	0.72	− 0.3	12 5.9	19 46.1	+ 1 12.8	+1.2454	0.5229	0.1633	+78	+45
86 Virginis	6	0.62	+ 0.2	11 50.4	2 5 36.5	+10 45.8	−0.6047	0.5271	0.1549	− 1	−79
B. A. C. 4700	6	+0.52	+ 1.5	−13 45.0	18 4.7	− 1 8.8	−0.3651	0.5327	−0.1428	+10	−59
5 Libræ	6½	0.35	3.0	14 58.5	3 11 16.1	− 8 29.6	−1.3008	0.5421	0.1225	−67	−90
α^1 Libræ	6	0.33	3.3	15 30.5	13 31.7	− 6 18.3	−0.9929	0.5439	0.1214	−30	−90
α^2 Libræ	2½	0.33	3.3	15 33.2	13 37.2	− 6 13.0	−0.9550	0.5432	0.1189	−28	−90
B. A. C. 4896	6	0.37	3.9	17 18.1	13 55.2	− 5 55.6	+0.9095	0.5432	0.1187	+73	+17
ν^3 Libræ	6½	+0.26	3.7	−16 1.7	21 10.7	+ 1 5.8	−1.2969	0.5479	−0.1087	−68	−90
26 Libræ	6	0.24	4.3	17 19.8	4 0 47.2	+ 4 35.2	−0.2651	0.5500	0.1031	+11	−53
28 Libræ	6½	0.20	4.5	17 43.9	3 44.0	+ 7 26.2	−0.1314	0.5518	0.0987	+18	−44
ζ^2 Libræ	6	0.16	4.5	17 2.1	7 46.3	+11 20.4	−1.2671	0.5542	0.0924	−62	−90
B. A. C. 5109	6	0.17	5.1	19 16.2	9 7.2	−11 21.4	+1.0184	0.5547	0.0905	+71	+26
41 Libræ	6	+0.15	+ 5.2	−18 54.8	12 0.7	− 8 33.7	+0.3785	0.5567	−0.0859	+46	−15
κ Libræ	5	0.14	5.3	19 17.8	13 23.9	− 7 13.3	+0.6739	0.5576	0.0830	+68	+ 2
λ Libræ	6	0.09	5.7	19 48.8	18 33.2	− 2 14.4	+0.8189	0.5604	0.0746	+70	+11
47 Libræ	6½	0.08	5.5	19 2.0	19 19.3	− 1 29.9	−0.0751	0.5605	0.0738	+18	−41
β^1 Scorpii	2	0.04	5.7	19 28.9	23 59.6	+ 3 0.8	+0.0802	0.5632	0.0654	+26	−32
β^2 Scorpii	5½	+0.04	+ 5.7	−19 28.8	23 59.7	+ 3 0.9	+0.0784	0.5632	−0.0654	+26	−32
ω^1 Scorpii	4½	0.03	5.9	20 21.0	5 0 35.4	+ 3 35.3	+0.9712	0.5639	0.0640	+70	+22
ω^2 Scorpii	5	+0.03	6.0	20 32.9	0 50.8	+ 3 50.2	+1.1673	0.5639	0.0638	+70	+41
ν^2 Scorpii	4	0.00	5.7	19 9.2	2 54.9	+ 5 50.0	−0.4539	0.5648	0.0600	+ 4	−67
ν^1 Scorpii	6	0.00	5.7	19 8.7	2 55.0	+ 5 50.1	−0.4628	0.5648	0.0600	+ 5	−67
ψ Ophiuchi	5	−0.05	+ 5.9	−19 45.6	8 16.0	+10 59.9	−0.0994	0.5675	−0.0504	+14	−42
B. A. C. 5580	6½	0.11	6.1	19 41.9	16 2.7	− 5 29.8	−0.4968	0.5715	0.0355	− 9	−70
ξ Ophiuchi	5	0.24	6.5	20 59.1	6 8 48.8	+10 40.0	+0.5500	0.5788	−0.0006	+51	− 5
				NEW	*MOON.*						
ν Aquarii	4½	−0.30	+ 4.3	−11 50.5	10 9 4.2	+ 7 22.0	+0.2862	0.5763	+0.1758	+49	−21
B. A. C. 7408	7	0.25	4.5	9 49.3	14 26.5	−11 27.3	−0.7939	0.5749	0.1822	−11	−90
17 Aquarii	6	0.26	4.4	9 49.0	14 51.6	−11 3.2	−0.7214	0.5746	0.1825	− 7	−90
19 Aquarii	5½	0.25	4.3	10 14.7	15 50.2	−10 6.6	−0.1126	0.5744	0.1834	+27	−43
ξ Aquarii	5	0.21	4.5	8 22.4	21 17.3	− 4 51.2	−0.9810	0.5731	0.1886	−22	−90
B. A. C. 7562	6½	−0.19	+ 4.0	− 9 34.5	11 0 24.2	− 1 51.0	+0.8226	0.5720	+0.1919	+81	+ 9
c^1 Capricorni	5	0.19	4.0	9 37.0	0 26.1	− 1 49.2	+0.8698	0.5720	0.1919	+81	+12
c^2 Capricorni	6	0.18	3.9	9 48.8	1 0.5	− 1 16.0	+1.1784	0.5719	0.1950	+81	+36
30 Aquarii	5½	0.13	4.1	7 5.1	8 26.9	+ 5 54.6	−0.1174	0.5702	0.1983	+29	−43
B. A. C. 7690	7	0.11	4.2	5 55.3	9 41.1	+ 7 6.2	−1.0416	0.5701	0.1991	−26	−90
B. A. C. 7704	7½	−0.11	+ 4.1	− 6 23.9	10 23.9	+ 7 47.5	−0.4193	0.5696	+0.1995	+12	−62
B. A. C. 7744	6	0.08	4.4	5 17.9	12 37.4	+ 9 56.3	−1.0814	0.5692	0.2009	−29	−90
44 Aquarii	5½	0.07	4.1	5 58.2	14 32.3	+11 47.1	−0.0201	0.5688	0.2022	+34	−38
51 Aquarii	5	−0.04	4.1	5 25.5	17 37.8	− 9 13.9	+0.0604	0.5682	0.2039	+39	−33
κ Aquarii	5	+0.01	3.9	4 49.7	23 40.2	− 3 24.2	−0.6972	0.5670	0.2065	+85	+ 2
Lalande 44337	7	+0.03	+ 4.0	− 4 9.7	12 1 1.0	− 2 6.1	+0.3068	0.5667	+0.2070	+54	−20
κ Piscium	5½	0.26	4.3	+ 0 37.0	21 33.2	− 6 16.7	−0.2063	0.5643	0.2098	+25	−48
9 Piscium	6	0.27	4.3	0 29.0	21 41.6	− 6 8.7	−0.0419	0.5641	0.2096	+34	−39
15 Piscium	6½	0.30	4.0	0 40.1	13 1 22.3	− 2 35.6	+0.5437	0.5641	0.2094	+72	− 7
16 Piscium	6	0.31	4.3	1 27.3	1 47.0	− 2 11.8	−0.1628	0.5641	0.2094	+27	−46
λ Piscium	5	+0.34	+ 4.1	+ 1 8.3	4 18.5	+ 0 14.5	+0.6829	0.5639	+0.2089	+87	+ 1
19 Piscium	6	+0.37	+ 4.5	+ 2 50.4	6 14.7	+ 2 6.7	−0.6262	0.5639	+0.2084	+ 2	−79

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
22 Piscium	6½	+0.39	+ 4.2	+ 2 16.9	**13** 8 43.4	+ 4 30.2	+0.4533	0.5640	+0.2077	+65	-12
45 Piscium	6	0.60	4.8	7 2.8	23 44.3	- 5 0.2	-1.2788	0.5644	0.2020	-48	-83
51 Piscium	6	0.63	3.6	6 18.8	**14** 2 42.8	- 2 7.9	+0.0556	0.5648	0.1990	+40	-32
62 Piscium	6	0.73	4.2	6 39.8	9 45.0	+ 4 39.6	+1.0869	0.5656	0.1941	+90	+30
δ Piscium	4½	0.73	4.0	6 56.9	9 55.5	+ 4 49.8	+0.8326	0.5656	0.1940	+90	+12
100 Piscium	7	+1.07	+ 4.1	+11 57.9	**15** 6 11.3	+ 0 22.9	-0.5129	0.5693	+0.1740	+ 8	-64
π Piscium	5½	1.06	4.0	11 32.7	7 10.4	+ 1 19.9	+0.0846	0.5694	0.1729	+41	-28
B. A. C. 490	7½	1.06	3.9	11 29.0	7 25.2	+ 1 34.2	+0.1897	0.5697	0.1722	+47	-24
19 Arietis	5½	1.30	3.6	14 43.9	22 42.3	- 7 41.4	-0.6304	0.5731	0.1521	+ 1	-71
29 Arietis	6½	1.42	2.7	14 30.9	**16** 7 13.5	+ 0 31.3	+0.8345	0.5750	0.1396	+90	+18
ο Arietis	6	+1.50	+ 2.2	+14 48.8	12 11.4	+ 5 18.4	+1.2006	0.5765	+0.1315	+90	+48
π Arietis	5½	1.55	2.6	16 58.6	14 10.6	+ 7 13.3	-0.7544	0.5769	0.1283	- 6	-73
ρ¹ Arietis	6	1.59	2.6	17 15.7	16 33.7	+ 9 31.1	-0.7482	0.5778	0.1239	- 6	-73
ρ³ Arietis	6	1.60	2.7	17 33.4	17 11.2	+10 7.3	-0.9736	0.5778	0.1231	-21	-73
50 Arietis	7	1.62	2.2	17 32.5	18 56.3	+11 48.6	-0.7450	0.5781	0.1199	- 6	-73
53 Arietis	6½	+1.66	+ 1.9	+17 25.6	21 51.4	- 9 22.8	-0.2840	0.5788	+0 1148	+20	-42
54 Arietis	6½	1.66	2.1	18 20.7	22 13.7	- 9 1.3	-1.1820	0.5788	0.1143	-41	-72
13 Tauri	5½	1.86	0.6	19 19.5	**17** 12 30.0	+ 4 43.6	-0.7556	0.5813	0.0871	- 7	-71
14 Tauri	6½	1.89	+ 0.4	19 17.6	13 6.8	+ 5 19.0	-0.6699	0.5816	0.0864	- 2	-68
B. A. C. 1242	6½	1.97	- 0.3	19 52.2	20 21.3	-11 42.5	-0.6937	0.5822	0.0723	- 3	-69
ω¹ Tauri	6	+2.00	- 0.8	+19 17.9	23 43.4	- 8 28.0	+0.1275	0.5828	+0.0655	+44	-14
ω² Tauri	5½	2.05	1.1	20 17.4	**18** 3 5.7	- 5 13.3	-0.6916	0.5829	0.0583	- 3	-68
53 Tauri	6	2.06	1.1	20 51.5	3 59.1	- 4 21.8	-1.2300	0.5831	0.0566	-50	-69
ε Tauri	3½	2.09	2.0	18 55.2	7 51.0	- 0 38.5	+0.9810	0.5831	0.0484	+90	+37
ι Tauri	5	2.25	3.6	21 25.2	22 11.9	-10 49.5	-1.1368	0.5830	0.0187	-38	-69
l Tauri	5½	+2.26	- 4.0	+20 15.6	**19** 0 12.0	- 8 53.9	+0.1024	0.5829	+0.0149	+43	-11
105 Tauri	6	2.27	3.7	21 32.9	0 13.1	- 8 52.9	-1.2397	0.5829	0.0144	-53	-69
107 Tauri	7	2.26	4.1	19 42.3	0 38.6	- 8 28.3	+0.6860	0.5828	+0.0130	+90	+21
ζ Tauri	3½	2.37	5.6	21 4.1	12 42.9	+ 3 9.3	-0.7325	0.5813	-0.0124	- 6	-69
χ¹ Orionis	4½	2.41	6 6	20 15.1	19 49.5	+10 0.3	-0.0175	0.5793	0.0269	+35	-18
χ² Orionis	5	+2.40	- 6.8	+19 43.4	20 4.1	+10 14.3	+0.5297	0.5793	-0.0274	+74	+11
χ³ Orionis	6	2.42	7.2	19 41.3	23 41.3	-10 16.4	+0.4532	0.5784	0.0350	+67	+ 6
χ⁴ Orionis	5	2.43	7.1	20 8.3	23 52.6	-10 5.4	-0.0245	0.5785	0.0352	+35	-20
68 Orionis	6	2.45	7.6	19 48.8	**20** 3 20.7	- 6 44.9	+0.1840	0.5774	0.0417	+48	- 9
71 Orionis	6	2.45	7.9	19 11.5	4 34.5	- 5 33.8	+0.7838	0 5770	0.0447	+90	+25
15 Geminorum, 2d*	6	+2.49	- 8.5	+20 51.5	10 5.6	- 0 14.6	-1.2474	0.5754	-0.0553	-54	-69
16 Geminorum	6	2.48	8.5	20 33.7	10 10.4	- 0 10.0	-0.9399	0.5754	0.0553	-20	-70
ν Geminorum	4½	2.48	8.6	20 17.0	10 37.0	+ 0 15.6	-0.6694	0.5748	0.0566	- 2	-65
f Geminorum	6	2.52	12.2	17 56.2	**21** 16 52·1	+ 5 25.0	-0.8368	0.5609	0.1110	-12	-72
1 Cancri	6	2.50	13.0	16 5.9	**22** 1 55.8	- 9 47.4	+0.1782	0 5573	0.1230	+47	-18
5 Cancri	6½	+2.51	-13.2	+16 46.5	4 0.0	- 7 47.4	-0.8028	0.5563	-0.1257	-10	-73
29 Cancri	6	2.46	14.3	14 35.6	16 45.7	+ 4 33.2	-0.1810	0.5492	0.1427	+26	-40
A¹ Cancri	6	2.43	14.5	13 5.8	23 45.4	+11 19.3	+0.4041	0.5455	0.1507	+62	- 9
A² Cancri	6	2.43	14.6	12 32.1	**23** 1 34.0	-10 55.6	+0.7369	0.5445	0.1528	+90	+10
60 Cancri	6	2.42	14.8	12 4.1	5 56.0	- 6 41.9	+0.5653	0.5424	0.1570	+75	- 1
α Cancri	4	+2.42	-14.7	+12 18.4	7 10.4	- 5 29.8	+0.1134	0.5417	-0.1581	+43	-25
κ Cancri	5	2.38	14.8	11 8.1	11 44.0	- 1 4.8	+0.6494	0.5393	0.1625	+84	+ 3
ω Leonis	5½	2.35	15.1	9 33.7	22 2.0	+ 8 54.2	+0.6390	0.5346	0.1709	+82	+ 2
h Leonis	5½	2.34	15.3	10 13.6	23 47.0	+10 36.0	-0.3841	0.5335	0.1723	+15	-56
B. A. C. 3407	6	2.27	15.4	8 51.9	**24** 13 5.3	- 0 29.7	-1.2555	0.5281	0.1805	-45	-81
π Leonis	5	+2.27	-15.4	+ 8 36.0	14 10.0	+ 0 33.0	-1.1609	0.5276	-0.1810	-35	-82
14 Sextantis	6	2.25	15.0	6 10.7	17 34.8	+ 3 51.7	+0.8618	0.5260	0.1829	+90	+13
16 Sextantis	6	2.24	15.1	6 44.5	18 50.6	+ 5 5.3	+0.0164	0.5255	0.1833	+37	-34
34 Sextantis	6½	2.15	14.5	4 11.4	**25** 12 18.6	- 1 57.3	-0.4468	0.5204	0.1891	+12	-64
36 Sextantis	6	2.14	14.3	3 6.0	13 39.1	- 0 39.2	+0.4965	0.5199	0.1894	+68	- 9
55 Leonis	6	+2.11	-13.9	+ 1 21.5	19 14.4	+ 4 46.5	+1.3518	0.5184	-0.1904	+90	+65
p² Leonis	5	+2.09	-13.6	+ 0 37.6	23 27.3	+ 8 52.2	+1.3571	0.5174	-0.1907	+90	+67

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
p^3 Leonis	6	+2.08	-13.9	+ 2 35.2	26 1 13.0	+10 34.8	-1.1426	0.5172	-0.1908	-33	-88
p^5 Leonis	5½	2.06	13.5	+ 0 33.8	3 52.2	-10 52.3	+0.3913	0.5162	0 1909	+60	-15
υ Leonis	5	1.98	12.8	- 0 10.9	17 16.9	+ 2 11.4	-1.1532	0.5147	0.1901	-34	-90
χ Virginis	5	1.79	8.9	7 21.1	28 2 34.9	+10 32.8	+0.6002	0.5157	0.1792	+75	- 3
28 Virginis	6	1.77	8.9	6 51.4	4 6.7	-11 58.1	-0.2216	0.5158	0.1784	+23	-49
ψ Virginis	5	+1.73	- 7.9	- 8 54.3	10 40.9	- 5 35.1	+0.8884	0.5170	- 0.1747	+81	+14
g Virginis	6	1.67	7.1	10 7.0	17 49.2	+ 1 20.9	+0.9984	0.5184	0.1700	+80	+22
B. A. C. 4394	6	1.66	7.6	8 21.5	18 10.5	+ 1 41.5	-1.0095	0.5183	0.1697	-25	-90
50 Virginis	6	1.66	7.1	9 42 5	18 48.2	+ 2 18.1	+0.3783	0.5188	0.1692	+56	-16
56 Virginis	6½	1.63	6.9	9 45.0	21 25.2	+ 4 50.7	-0.0148	0.5194	0.1674	+33	-37
58 Virginis	6	+1.64	- 6.6	- 9 56.0	22 50.6	+ 6 13.6	-0.0498	0.5198	-0.1664	+30	-39
62 Virginis	6½	1.63	6.3	10 41.5	29 0 20.8	+ 7 41.1	+0.5424	0.5202	0.1655	+67	- 6
α Virginis	1	1.61	6.2	10 33.1	2 52.6	+10 8.4	-0.0295	0.5209	0.1634	+31	-38
86 Virginis	6	1.51	4.9	11 50.5	13 35.7	- 3 27.3	-0.3074	0.5242	0.1540	+15	-55
B. A. C. 4700	6	1.42	3.8	13 45.1	30 2 13.0	+ 8 47.2	-0.0679	0.5292	0.1419	+26	-40
5 Libræ	6½	+1.25	- 1.3	-14 58.6	19 40.5	+ 1 42.6	-1.0242	0.5374	-0.1214	-33	-90
α^1 Libræ	6	1.24	1.1	15 30.6	21 58.5	+ 3 56.3	-0.7134	0.5384	0.1188	-12	-90
α^2 Libræ	2½	1.24	1.1	15 33.3	22 4.1	+ 4 1.7	-0.6751	0.5384	0.1186	-10	-89
B. A C. 4896	6	1.24	0.2	17 18.2	22 22.4	+ 4 19.3	+1.2006	0.5390	0.1177	+73	+43
ν^1 Libræ	6	1.14	0.3	15 48.1	31 5 40.6	+11 23.8	-1.2659	0.5422	0.1080	-60	-90
ν^2 Libræ	6½	+1.15	- 0.3	-16 1.8	5 46.0	+11 29.0	-1.0257	0.5422	-0.1080	-34	-90
26 Libræ	6	1.12	+ 0.5	17 19.9	9 26.6	- 8 57.5	+0.0054	0.5441	0.1026	+26	-36
28 Libræ	6½	1.11	0.8	17 44.0	12 26.9	- 6 3.0	+0.1396	0.5456	0.0982	+33	-28
ζ^2 Libræ	6	1.06	0.8	17 2.2	16 34.1	- 2 3.8	-1.0100	0.5480	0.0918	-35	-90
41 Libræ	6	1.03	1.9	18 54.9	20 53.5	+ 2 7.1	+0.6449	0.5499	0.0858	+66	0
κ Libræ	5	+1.02	+ 2.1	-19 17.9	22 18.5	+ 3 29.3	+0.9388	0.5505	-0.0839	+71	+20

FEBRUARY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
λ Libræ	6	+0.95	+ 2.8	-19 48.9	1 3 34.2	+ 8 34.4	+1.0784	0.5636	-0.0746	+71	+31
47 Libræ	6½	+0.94	+ 2.5	-19 2.1	4 21.2	+ 9 19.9	+0.1782	0.5540	-0.0743	+32	-26
β^1 Scorpii	2	0.89	3.0	19 28.9	9 7.3	-10 3.6	+0.3268	0.5567	0.0659	+40	-18
β^2 Scorpii	5½	0.89	3.0	19 28.8	9 7.5	-10 3.5	+0.3232	0.5567	0.0659	+40	-18
ω^1 Scorpii	4½	0.89	3.3	20 21.0	9 43.9	- 9 28.3	+1.2224	0.5571	0.0646	+70	+49
ν^1 Scorpii	6	0.85	3.0	19 8.7	12 6.4	- 7 10.6	-0.2242	0.5583	0.0608	+ 9	-50
ν^2 Scorpii	4	+0.85	+ 3.0	-19 9.2	12 6.4	- 7 10.6	-0.2152	0.5583	-0.0608	+ 9	-50
ψ Ophiuchi	5	0.80	3.4	19 45.6	17 34.0	- 1 54.2	+0.1305	0.5610	0.0506	+27	-29
B. A. C. 5580	6½	0.71	3.9	19 41.9	2 1 29.9	+ 5 45.4	-0.2811	0 5651	0.0361	+ 3	-54
ξ Ophiuchi	5	0.52	5.2	20 59.1	18 34.3	- 1 46.4	+0.7411	0.5727	-0.0030	+69	+ 7
VENUS				19 17.8	3 12 17.0	- 8 42.2	-0.7766	0.5817	+0.0358	-25	-90
B. A. C. 6098	6	+0.33	+ 5.7	-20 44.1	12 23.1	- 8 36.3	+0.7330	0.5791	+0.0329	+70	+ 6
15 Sagittarii	5	0.27	5.9	20 45.6	17 42.5	- 3 28.6	+0.9614	0.5808	0.0439	+70	+22
16 Sagittarii	6	0.27	5.8	20 25.2	17 43.1	- 3 28.1	+0.6071	0.5808	0.0439	+59	- 2
21 Sagittarii	5	0.24	6.0	20 36.1	21 58.7	+ 0 38.1	+0.9984	0.5818	0 0526	+70	+25
B. A. C. 6294	6	0.20	5.5	18 28.9	4 0 34.7	+ 3 8.2	-1.0556	0.5822	0.0581	-42	-90
B. A. C. 6536	6	+0.08	+ 5.9	-19 29.2	15 57.6	- 6 3.2	+1.1003	0.5849	+0.0893	+71	+33
d Sagittarii	5	+0.05	5.7	19 9.5	19 51.9	- 2 17.6	+1.1418	0.5851	0.0905	+71	+37
β Capricorni	3	-0.09	4.7	-15 8.8	5 22 20.1	- 0 48.6	+0.2775	0.5853	0.1448	+45	-21
				NEW	*MOON.*						
κ Piscium	5½	+0.09	+ 2.4	+ 0 36.9	9 5 24.5	+ 3 22.3	-0.3963	0.5755	+0.2118	+15	-61
9 Piscium	6	0.09	2.5	0 28.9	5 32.7	+ 3 30.2	-0.2361	0.5755	0.2118	+23	-50
15 Piscium	6½	0.11	2.2	0 40.0	9 5.7	+ 6 55.5	+0.3336	0.5754	0.2115	+56	-18
16 Piscium	6	0.13	2.4	1 27.2	9 29 5	+ 7 18.5	-0.3634	0.5754	0.2114	+17	-58
λ Piscium	5	0.14	2.2	1 8.2	11 55.7	+ 9 39.4	+0.4643	0.5751	0.2111	+66	-11
19 Piscium	6	+0.16	+ 2.4	+ 2 50.3	13 47.8	+11 27.5	-0.8277	0.5750	+0.2107	-10	-87
22 Piscium	6½	+0.17	+ 2.2	+ 2 16.8	16 11.4	-10 14.1	+0.2297	0.5750	+0.2100	+50	-24

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
25 Piscium	6	+0.17	+ 2.1	+ 1 26.4	9 16 40.1	− 9 46.4	+1.1636	0.5750	+0.2098	+90	+35
51 Piscium	6	0.35	2.2	6 18.7	10 9 34.4	+ 6 31.3	−0.1890	0.5753	0.2014	+26	−46
60 Piscium	6½	0.42	1.8	6 6.2	16 0.6	−11 16.3	+1.2990	0.5757	0.2010	+90	+54
62 Piscium	6	0.44	1.9	6 39.7	16 23.2	−10 54.6	+0.8174	0.5757	0.1959	+90	+11
δ Piscium	4½	0.45	2.0	6 56.8	16 33.4	−10 44.7	+0.5666	0.5758	0.1959	+74	− 4
π Piscium	5½	+0.71	+ 1.8	+11 32.6	11 13 12.5	+ 9 9.5	−0.1889	0.5772	+0.1746	+26	−43
B. A. C. 609	6	0.82	1.2	11 43.6	22 40.6	− 5 43.1	+1.2198	0.5781	0.1617	+90	+47
19 Arietis	5½	0.93	1.6	14 43.8	12 4 24.0	− 0 12.3	−0.9036	0.5791	0.1531	−16	−76
29 Arietis	6½	1.03	0.9	14 30.9	12 46.3	+ 7 51.5	+0.5421	0.5799	0.1404	+73	+ 1
o Arietis	6	1.10	0.5	14 48.8	17 40.0	−11 25.6	+0.9103	0.5807	0.1321	+90	+24
π Arietis	5½	+1.15	+ 1.0	+16 58.6	19 37.7	− 9 32.2	−1.0316	0.5807	+0.1287	−26	−73
ρ^1 Arietis	6	1.18	0.9	17 15.7	21 59.1	− 7 16.0	−1.0224	0.5808	0.1249	−25	−73
ρ^3 Arietis	6	1.19	1.0	17 33.4	22 36.1	− 6 40.4	−1.2462	0.5808	0.1234	−50	−73
53 Arietis	6½	1.25	+ 0.5	17 25.6	13 3 13.6	− 2 13.2	−0.5626	0.5812	0.1159	+ 5	−62
13 Tauri	5½	1.47	− 0.3	19 19.5	17 46.8	+11 47.7	−1.0266	0.5818	0.0879	−27	−71
14 Tauri	6½	+1.48	− 0.4	+19 17.6	18 23.4	−11 37.1	−0.9412	0.5818	+0.0866	−20	−71
B. A. C. 1240	6	1.56	1.8	17 51.8	14 1 31.7	− 4 44.6	+1.1008	0.5820	0.0726	+90	+45
B. A. C. 1242	6½	1.58	1.1	19 52.2	1 37.5	− 4 39.0	−0.9601	0.5818	0.0725	−22	−70
ω^1 Tauri	6	1.62	1.7	19 17.9	4 59.8	− 1 24.2	−0.1376	0.5817	0.0659	+28	−29
ω^2 Tauri	5½	1.68	1.7	20 17.4	8 22.3	+ 1 50.8	−0.9510	0.5817	0.0596	−21	−70
ε Tauri	3½	+1.72	− 2.7	+18 55.2	13 8.7	+ 6 26.6	+0.7236	0.5815	+0.0492	+90	+20
l Tauri	5½	1.94	4.2	20 15.6	15 5 36.7	− 1 41.8	−0.1357	0.5793	+0.0151	+28	−24
ζ Tauri	3½	2.09	5.6	21 4.1	18 16.1	+10 29.8	−0.9552	0.5767	−0.0101	−22	−69
χ^1 Orionis	4½	2.15	6.7	20 15.1	16 1 28.4	− 6 33.4	−0.2264	0.5748	0.0253	+23	−30
χ^2 Orionis	5	2.14	6.9	19 43.4	1 43.1	− 6 19.3	+0.3229	0.5744	0.0256	+57	0
χ^3 Orionis	6	+2.17	− 7.2	+19 41.3	5 23.5	− 2 46.8	+0.2549	0.5744	−0.0331	+52	− 4
χ^4 Orionis	5	2.19	7.0	20 8.3	5 34.9	− 2 35.7	−0.2268	0.5731	0.0332	+23	−31
68 Orionis	6	2.22	7.6	19 48.8	9 6.2	+ 0 48.0	−0.0123	0.5722	0.0396	+36	−20
71 Orionis	6	2.22	8.0	19 11.5	10 20.9	+ 2 0.0	+0.5936	0.5718	0.0419	+80	+13
16 Geminorum	6	2.30	8.3	20 33.7	16 2.2	+ 7 29.3	−1.1285	0.5698	0.0530	−37	−70
ν Geminorum	4½	+2.30	− 8.4	+20 17.0	16 29.3	+ 7 55.4	−0.8566	0.5696	−0.0542	−14	−70
λ Geminorum	4	2.42	11.6	16 44.9	17 14 29.2	+ 5 9.5	+1.2882	0.5606	0.0927	+90	+69
f Geminorum	6	2.48	12.3	17 56.2	18 0 15.0	− 9 24.5	−0.9620	0.5563	0.1076	−21	−74
1 Cancri	6	2.48	13.5	16 5.9	8 26.0	− 1 29.8	+0.0807	0.5522	0.1199	+41	−23
5 Cancri	6½	2.51	13.4	16 46.5	10 32.2	+ 0 32.3	−0.9042	0.5512	0.1227	−17	−74
29 Cancri	6	+2.54	−15.0	+14 35.6	23 28.4	−10 56.6	−0.2470	0.5455	−0.1393	+23	−43
A^1 Cancri	6	2.57	15.5	13 5.7	19 6 33.4	− 4 5.1	+0.3613	0.5425	0.1472	+59	−11
A^2 Cancri	6	2.57	15.7	12 32.0	8 23.2	− 2 18.8	+0.6976	0.5414	0.1493	+90	+ 8
60 Cancri	6	2.58	16.1	12 4.0	12 48.1	+ 1 57.8	+0.5375	0.5395	0.1537	+72	− 2
a Cancri	4	2.57	16.1	12 18.3	14 3.3	+ 3 10.8	+0.0869	0.5394	0.1548	+41	−26
κ Cancri	5	+2.57	−16.3	+11 8.0	18 39.6	+ 7 38.4	+0.6365	0.5371	−0.1593	+82	+ 3
ω Leonis	5½	2.57	16.9	9 33.6	20 5 2.8	− 6 17.4	+0.6510	0.5329	0.1679	+83	+ 3
h Leonis	5½	2.57	17.0	10 13.5	6 48.5	− 4 34.9	−0.3730	0.5323	0.1692	+16	−55
B. A. C. 3407	6	2.57	17.3	8 51.9	20 11.2	+ 8 23.7	−1.2106	0.5278	0.1778	−40	−81
π Leonis	5	2.57	17.3	8 36.0	21 16.2	+ 9 26.7	−1.1161	0.5274	0.1784	−31	−82
14 Sextantis	6	+2.55	−17.4	+ 6 10.6	21 0 41.8	−11 13.6	+0.9249	0.5260	−0.1801	+90	+18
16 Sextantis	6	2.56	17.4	6 44.4	1 57.9	− 9 59.8	+0.0787	0.5259	0.1810	+41	−30
34 Sextantis	6½	2.54	17.4	4 11.3	19 27.5	+ 6 59.2	−0.3416	0.5213	0.1873	+18	−56
36 Sextantis	6	2.54	17.4	3 5.9	20 48.1	+ 8 17.5	+0.6080	0.5211	0.1875	+78	− 3
p^3 Leonis	6	2.53	17.1	2 35.1	22 8 21.4	− 4 29.2	−1.0048	0.5190	0.1892	−22	−88
p^5 Leonis	5½	+2.52	−16.9	+ 0 33.7	12 0.1	− 0 56.7	+0.5415	0.5184	−0.1896	+72	− 7
υ Leonis	5	2.48	16.5	− 0 11.0	23 0 23.0	+11 5.1	−0.9800	0.5174	0.1890	−20	−90
χ Virginis	5	2.41	13.5	7 21.2	24 9 35.7	− 4 38.9	+0.8422	0.5178	0.1865	+83	+10
28 Virginis	6	2.40	13.4	6 51.5	11 7.3	− 3 9.9	+0.0167	0.5180	0.1775	+36	−35
ψ Virginis	5	2.40	12.6	8 54.4	17 41.0	+ 3 12.5	+1.1400	0.5189	0.1736	+81	+33
g Virginis	6	+2.37	−11.6	−10 7.1	25 0 49.1	+10 8.4	+1.2621	0.5201	−0.1691	+80	+47
B. A. C. 4394	6	+2.35	−12.1	− 8 21.6	1 10.3	+10 28.9	−0.7496	0.5201	−0.1689	− 8	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
50 Virginis	6	+2.35	-11.7	- 9 42.6	25 1 48.1	+11 5.6	+0.6441	0.5202	-0.1685	+76	- 1
56 Virginis	6½	2.35	11.5	9 45.1	4 25.1	-10 21.9	+0.2498	0.5207	0.1663	+48	-22
58 Virginis	6	2.32	11.2	9 56.1	5 50.7	- 8 58.9	+0.2183	0.5211	0.1656	+46	-24
62 Virginis	6½	2.32	11.0	10 41.6	7 20.9	- 7 31.2	+0.8122	0.5213	0.1645	+80	+10
α Virginis	1	2.31	10.9	10 33.2	9 53.0	- 5 3.6	+0.2405	0.5219	0.1624	+46	-23
86 Virginis	6	+2.26	- 9.5	-11 50.5	20 38.0	+ 5 22.5	-0.0028	0.5249	-0.1532	+30	-38
B. A. C. 4700	6	2.20	7.8	13 45.1	26 9 19.5	- 6 18.6	+0.2213	0.5282	0.1411	+40	-26
5 Libræ	6½	2.08	5.5	14 58.7	27 2 56.9	+10 46.6	-0.7297	0.5350	0.1206	-13	-90
α^1 Libræ	6	2.06	5.0	15 30.7	5 16.8	-10 57.9	-0.4188	0.5358	0.1178	+ 5	-63
α^2 Libræ	2½	2.06	5.0	15 33.4	5 22.4	-10 52.4	-0.3802	0.5358	0.1178	+ 7	-60
ν^1 Libræ	6	+1.99	- 4.1	-15 48.2	13 5.2	- 3 24.0	-0.9731	0.5391	-0.1074	-30	-90
ν^2 Libræ	6½	2.00	4.1	16 1.9	13 10.6	- 3 18.8	-0.7313	0.5391	0.1074	-14	-90
26 Libræ	6	1.98	3.2	17 19.9	16 54.8	+ 0 18.3	+0.3057	0.5405	0.1020	+43	-19
28 Libræ	6½	1.96	2.8	17 44.0	19 58.0	+ 3 15.7	+0.4407	0.5416	0.0976	+52	-11
ζ^3 Libræ	6	1.91	2.6	17 2.2	28 0 9.5	+ 7 19.2	-0.7175	0.5436	0.0918	-15	-90
41 Libræ	6	+1.89	- 1.4	-18 54.9	4 33.8	+11 35.1	+0.9495	0.5453	-0.0847	+71	+21
κ Libræ	5	1.88	1.2	19 17.9	6 0.4	-11 1.1	+1.2462	0.5462	0.0829	+71	+52
47 Libræ	6½	1.80	- 0.6	19 2.1	12 10.5	- 5 3.1	+0.4762	0.5486	0.0734	+52	+ 9
β^1 Scorpii	2	1.77	0.0	19 29.0	17 2.9	- 0 20.3	+0.6258	0.5508	0.0655	+62	0
β^2 Scorpii	5½	1.77	0.0	19 28.9	17 3.1	- 0 20.1	+0.6238	0.5508	0.0655	+63	0
ν^1 Scorpii	6	+1.72	+ 0.1	-19 8.8	20 6.0	+ 2 36.8	+0.0688	0.5521	-0.0601	+25	-32
ν^2 Scorpii	4	+1.72	+ 0.1	-19 9.3	20 6.0	+ 2 36.8	+0.0779	0.5521	-0.0601	+25	-31
MARCH.											
ψ Ophiuchi	5	+1.67	+ 0.9	-19 45.7	1 1 41.5	+ 8 1.1	+0.4264	0.5545	-0.0506	+46	-12
B. A. C. 5580	6½	1.57	1.7	19 42.0	9 49.4	- 8 7.3	+0.0036	0.5578	0.0363	+19	-36
ξ Ophiuchi	5	1.38	4.0	20 59.1	2 3 21.8	+ 8 49.0	+1.0207	0.5643	-0.0046	+69	+27
B. A. C. 6060	6	1.16	4.4	18 46.7	18 48.2	- 0 17.1	-1.1617	0.5696	+0.0258	-55	-90
B. A. C. 6098	6	1.13	5.1	20 44.1	21 41.2	+ 2 29.7	+0.9917	0.5705	0.0313	+70	+25
15 Sagittarii	5	+1.07	+ 5.5	-20 45.6	3 3 9.7	+ 7 46.5	+1.2128	0.5720	+0.0416	+70	+48
16 Sagittarii	6	1.06	5.4	20 25.1	3 10.3	+ 7 47.1	+0.8531	0.5720	0.0416	+70	+14
21 Sagittarii	5	1.02	5.7	20 36.1	7 33.1	-11 59.1	+1.2459	0.5732	0.0508	+70	+54
B. A. C. 6294	6	0.98	5.1	18 28.8	10 13.6	- 9 24.8	-0.8367	0.5737	0.0554	-27	-90
Lalande 35497	6	0.81	6.1	19 24.7	23 43.0	+ 3 35.2	+1.0624	0.5765	0.0825	+71	+30
ρ^1 Sagittarii	4	+0.70	+ 6.0	-18 3.9	4 7 45.8	+11 20.7	+0.3838	0.5776	+0.0972	+46	-15
ρ^2 Sagittarii	5½	0.70	6.1	18 31.3	7 49.3	+11 24.0	+0.8622	0.5777	0.0972	+72	+14
e^1 Sagittarii	6	0.61	5.7	16 33.4	15 53.7	- 4 49.2	-0.3183	0.5788	0.1121	+ 9	-56
e^2 Sagittarii	5	0.60	5.7	16 23.6	16 39.7	- 4 4.9	-0.3986	0.5788	0.1138	+ 4	-61
B. A. C. 6746	6	0.59	5.5	15 44.4	17 6.5	- 3 39.1	-1.0191	0.5788	0.1140	-34	-90
g Sagittarii	5½	+0.52	+ 5.6	-15 47.9	23 13.8	+ 2 14.8	-0.2230	0.5794	+0.1246	+15	-49
β Capricorni	3	0.42	5.5	15 8.8	5 9 1.0	+11 40.5	+0.4196	0.5803	0.1415	+54	-13
B. A. C. 7087	6	0.37	5.2	14 7.3	14 37.1	- 6 55.8	+0.1972	0.5804	0.1506	+41	-25
ν Aquarii	4½	0.26	4.6	11 50.5	6 5 38.5	+ 7 32.6	+0.3256	0.5809	0.1720	+51	-18
14 Aquarii	6	0.24	4.1	9 42.0	8 31.2	+10 18.9	-1.3173	0.5809	0.1758	-63	-90
17 Aquarii	6	+0.23	+ 4.3	- 9 49.0	11 19.6	-10 58.9	-0.7026	0.5809	+0.1786	- 6	-90
19 Aquarii	5½	0.22	4.3	10 14.7	12 17.0	-10 3.5	-0.1031	0.5809	0.1799	+27	-42
ξ Aquarii	5	0.19	4.0	8 22.4	17 36.5	- 4 55.8	-0.9926	0.5811	0.1862	-25	-90
B. A. C. 7562	6½	0.17	4.0	9 34.5	20 38.3	- 2 0.7	+0.7722	0.5811	0.1894	+81	+ 7
c^1 Capricorni	5	0.17	4.0	9 37.0	20 40.2	- 1 58.9	+0.8204	0.5811	0.1894	+81	+10
c^2 Capricorni	6	+0.16	+ 4.0	- 9 48.8	21 13.5	- 1 26.8	+1.1200	0.5811	+0.1897	+80	+32
30 Aquarii	5½	0.14	3.6	- 7 5.1	7 4 25.9	+ 5 29.9	-0.1948	0.5811	0.1867	+24	-48
				NEW	*MOON.*						
δ Piscium	4½	0.26	0.6	+ 6 56.8	10 1 56.9	+ 0 26.8	+0.4039	0.5864	0.1976	+61	-12
ε Piscium	4	+0.28	+ 0.2	+ 7 15.6	7 51.3	+ 6 7.8	+1.2480	0.5875	+0.1920	+90	+47
π Piscium	5½	+0.40	+ 0.1	+11 32.6	21 52.7	- 4 22.5	-0.3782	0.5892	+0.1763	+15	-55

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0.		Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. A. C. 609	6	+0.50	− 0.5	+11 43.6	11 7 0.2	+ 4 24.2	+0.9931	0.5902	+0.1639	+90	+27
19 Arietis	5½	0.57	0.2	14 43.8	12 31.3	+ 9 42.7	−1.1026	0.5906	0.1549	−32	−76
29 Arietis	6½	0.64	1.0	14 30.9	20 35.7	− 6 31.4	+0.3104	0.5916	0.1419	+55	−12
o Arietis	6	0.69	1.3	14 48.8	12 1 18.7	− 1 59.1	+0.6637	0.5916	0.1341	+87	+ 9
π Arietis	5½	0.73	0.8	16 58.6	3 12.8	− 0 9.4	−1.2471	0.5917	0.1307	−50	−73
σ Arietis	5½	+0.72	− 1.6	+14 35.9	4 8.1	+ 0 43.8	+1.2514	0.5920	+0.1290	+90	+56
ρ^1 Arietis	6	0.75	0.9	17 15.7	5 29.3	+ 2 1.8	−1.2388	0.5920	0.1259	−49	−73
53 Arietis	6½	0.82	1.3	17 25.6	10 33.2	+ 6 54.1	−0.7925	0.5921	0.1165	− 9	−73
SATURN				16 17.8	17 55.1	−10 0.9	+1.1519	0.5887	0.1016	+90	+47
13 Tauri	5½	1.00	1.8	19 19.5	13 0 39.1	− 3 32.4	−1.2589	0.5915	0.0888	−55	−71
14 Tauri	6½	+1.00	− 1.8	+19 17.6	1 14.7	− 2 58.2	−1.1752	0.5915	+0.0882	−42	−71
B. A. C. 1240	6	1.08	3.0	17 51.8	8 10.7	+ 3 41.9	+0.8345	0.5907	0.0740	+90	+25
B. A. C. 1242	6½	1.09	2.3	19 52.2	8 16.3	+ 3 47.3	−1.1967	0.5907	0.0740	−45	−70
ω^1 Tauri	6	1.12	2.7	19 17.9	11 33.2	+ 6 56.6	−0.3885	0.5902	0.0662	+14	−45
ω^2 Tauri	5½	1.17	2.6	20 17.4	14 50.6	+10 6.6	−1.1923	0.5893	0.0596	−45	−70
ε Tauri	3½	+1.23	− 3.6	+18 55.1	19 29.9	− 9 24.8	+0.4618	0.5884	+0.0494	+67	+ 5
B. A. C. 1468	6	1.31	4.5	18 31.2	14 2 45.1	− 2 26.0	+1.1795	0.5868	0.0344	+90	+56
i Tauri	5½	1.33	4.6	18 38.3	4 51.0	− 0 24.9	+1.1280	0.5864	0.0300	+90	+51
l Tauri	5½	1.44	4.7	20 15.6	11 37.4	+ 6 6.4	−0.3873	0.5844	+0.0155	+14	−40
ζ Tauri	3½	1.60	5.9	21 4.1	15 0 4.9	− 5 53.9	−1.1967	0.5803	−0.0099	−46	−69
127 Tauri	6½	+1.60	− 6.7	+18 55.3	2 20.9	− 3 43.0	+1.0111	0.5795	−0.0143	+90	+43
χ^1 Orionis	4½	1.68	6.7	20 15.1	7 12.2	+ 0 57.7	−0.4721	0.5772	0.0240	+ 9	−46
χ^2 Orionis	5	1.67	6.9	19 43.4	7 26.7	+ 1 11.7	+0.0749	0.5768	0.0253	+40	−13
χ^3 Orionis	6	1.70	7.5	19 41.3	11 4.9	+ 4 42.0	+0.0087	0.5753	0.0320	+36	−18
χ^4 Orionis	5	1.71	7.3	20 8.3	11 16.1	+ 4 52.8	−0.4679	0.5753	0.0320	+ 9	−47
68 Orionis	6	+1.75	− 7.7	+19 48.8	14 45.5	+ 8 14.7	−0.2554	0.5738	−0.0392	+21	−33
71 Orionis	6	1.76	8.0	19 11.5	15 59.9	+ 9 26.4	+0.3483	0.5735	0.0415	+58	0
ν Geminorum	4½	1.83	8.4	20 17.0	22 5.7	− 8 40.8	−1.0907	0.5703	0.0529	−33	−70
26 Geminorum	5½	1.88	9.8	17 45.3	16 4 2.8	− 2 56.3	+1.2303	0.5675	0.0638	+90	+60
λ Geminorum	4	2.03	11.5	16 44.9	20 2.9	−11 29.4	+1.0683	0.5595	0.0908	+90	+40
68 Geminorum	5½	+2.10	−12.2	+16 4.5	17 3 9.6	− 4 37.1	+1.1041	0.5560	−0.1019	+90	+42
f Geminorum	6	2.14	11.8	17 56.2	5 49.8	− 2 2.3	−1.1679	0.5542	0.1061	−40	−72
1 Cancri	6	2.18	13.1	16 5.9	14 3.0	+ 5 54.7	−0.1165	0.5502	0.1174	+30	−33
5 Cancri	6½	2.20	13.0	16 46.5	16 9.7	+ 7 57.2	−1.0965	0.5492	0.1202	−32	−74
29 Cancri	6	2.27	14.5	14 35.6	18 5 11.0	− 3 26.6	−0.4204	0.5429	0.1365	+13	−55
A^1 Cancri	6	+2.31	−15.3	+13 5.7	12 19.1	+ 3 28.0	+0.1991	0.5396	−0.1444	+48	−19
A^2 Cancri	6	2.32	15.5	12 32.0	14 9.7	+ 5 15.1	+0.5232	0.5388	0.1463	+71	− 2
60 Cancri	6	2.35	15.8	12 4.0	18 36.7	+ 9 33.8	+0.3882	0.5366	0.1511	+60	−10
α Cancri	4	2.36	15.8	12 18.3	19 52.5	+10 47.3	−0.0635	0.5360	0.1522	+32	−35
κ Cancri	5	2.37	16.2	11 8.0	19 0 31.1	− 8 42.7	+0.4975	0.5342	0.1567	+69	− 5
ω Leonis	5½	+2.45	−17.1	+ 9 33.6	10 59.6	+ 1 26.8	+0.5304	0.5302	−0.1650	+71	− 4
h Leonis	5½	2.46	17.1	10 13.6	12 46.3	+ 3 10.3	−0.4943	0.5295	0.1663	+ 9	−64
B. A. C. 3407	6	2.50	17.5	8 51.9	20 2 15.5	− 7 44.6	−1.3095	0.5254	0.1749	−55	−81
π Leonis	5	2.51	17.6	8 36.0	3 21.1	− 6 40.9	−1.2092	0.5250	0.1755	−41	−82
16 Sextantis	6	2.52	18.0	6 44.0	8 4.7	− 2 5.6	0.0000	0.5237	0.1780	+36	−35
34 Sextantis	6½	+2.58	−18.5	+ 4 11.3	21 1 41.3	− 8 59.5	−0.3866	0.5195	−0.1841	+15	−59
36 Sextantis	6	2.59	18.6	3 5.9	3 2.2	− 7 41.0	+0.5690	0.5195	0.1849	+74	− 5
p^3 Leonis	6	2.63	18.5	2 35.1	14 38.7	+ 3 35.6	−1.0240	0.5182	0.1870	−24	−88
p^5 Leonis	5½	2.65	18.5	+ 0 33.7	18 18.4	+ 7 9.1	+0.5316	0.5177	0.1872	+71	− 7
υ Leonis	5	2.67	18.3	− 0 11.0	22 6 43.2	− 4 47.3	−0.9652	0.5175	0.1867	−20	−90
f Virginis	6	+2.75	−16.5	− 5 11.6	23 14 43.2	+ 2 18.3	−1.2656	0.5193	−0.1775	−48	−90
χ Virginis	5	2.76	16.3	7 21.3	15 56.0	+ 3 29.0	+0.9228	0.5194	0.1770	+83	+16
28 Virginis	6	2.75	16.2	6 51.6	17 27.4	+ 4 57.7	+0.1056	0.5198	0.1758	+40	−30
ψ Virginis	5	2.76	15.5	8 54.5	24 0 0.5	+11 19.6	+1.2397	0.5207	0.1724	+81	+44
B. A. C. 4394	6	2.76	14.9	8 21.6	7 28.8	− 5 25.1	−0.6411	0.5223	0.1677	− 2	−82
50 Virginis	6	+2.77	−14.7	− 9 42.6	8 6.6	− 4 48.4	+0.7541	0.5223	−0.1675	+76	+ 6
56 Virginis	6½	+2.77	−14.6	− 9 45.1	10 43.2	− 2 16.4	+0.3651	0.5229	−0.1655	+55	−14

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
58 Virginis	6	+2.77	-14.3	- 9 56.1	24 12 8.6	- 0 53.5	+0.3334	0.5229	-0.1645	+53	-18
62 Virginis	6½	2.77	14.1	10 41.6	13 38.5	+ 0 33.9	+0.9301	0.5223	0.1632	+80	+47
α Virginis	1	2.77	13.9	10 33.2	16 10.3	+ 3 1.2	+0.3650	0.5240	0.1615	+54	-16
86 Virginis	6	2.78	12.6	11 50.6	25 2 54.0	-10 34.1	+0.1147	0.5272	0.1524	+38	-30
B. A. C. 4700	6	2.77	11.0	13 45.2	15 34.3	+ 1 43.6	+0.3808	0.5305	0.1397	+53	-15
λ Virginis	4½	+2.74	-10.6	-12 50.1	19 47.9	+ 5 49.6	-1.2193	0.5316	-0.1354	-49	-90
5 Libræ	6½	2.72	8.4	14 58.7	26 9 12.2	- 5 10.6	-0.5549	0.5359	0.1198	- 3	-74
α^1 Libræ	6	2.72	8.1	15 30.7	11 32.1	- 2 55.1	-0.2395	0.5371	0.1165	+14	-50
α^2 Libræ	2½	2.72	8.1	15 33.4	11 37.9	- 2 49.4	-0.2009	0.5371	0.1165	+16	-48
ν^1 Libræ	6	2.67	7.0	15 48.2	19 22.2	+ 4 40.5	-0.7893	0.5395	0.1067	-18	-90
ν^2 Libræ	6½	+2.68	- 7.0	-16 1.9	19 27.5	+ 4 45.6	-0.5483	0.5398	-0.1059	- 4	-74
26 Libræ	6	2.67	6.1	17 20.0	23 12.6	+ 8 23.7	+0.4999	0.5409	0.1013	+56	- 8
28 Libræ	6½	2.67	5.5	17 44.1	27 2 16.7	+11 21.9	+0.6375	0.5419	0.0970	+67	0
ζ^1 Libræ	6½	2.62	5.6	16 18.6	5 51.8	- 9 9.8	-1.2679	0.5433	0.0916	-63	-90
ζ^3 Libræ	6	2.63	5.3	17 2.3	6 29.4	- 8 33.4	-0.5248	0.5437	0.0905	- 4	-70
41 Libræ	6	+2.63	- 4.0	-18 55.0	10 55.6	- 4 15.7	+1.1545	0.5450	-0.0841	+71	+39
47 Libræ	6½	2.59	2.9	19 2.1	18 36.1	+ 3 10.0	+0.6820	0.5475	0.0720	+68	+ 3
β^1 Scorpii	2	2.55	2.1	19 29.0	23 31.4	+ 7 55.7	+0.8362	0.5494	0.0641	+71	+13
β^2 Scorpii	5½	2.55	2.1	19 29.9	23 31.4	+ 7 55.7	+0.8527	0.5494	0.0641	+71	+14
ν^1 Scorpii	6	2.51	1.8	19 8.8	28 2 36.4	+10 54.8	+0.2753	0.5500	0.0591	+37	-20
ν^2 Scorpii	4	+2.51	- 1.8	-19 9.3	2 36.4	+10 54.8	+0.2845	0.5500	-0.0584	+37	-20
ψ Ophiuchi	5	2.47	0.8	19 45.7	8 16.3	- 7 36.5	+0.6389	0.5518	0.0502	+63	+ 1
χ Ophiuchi	6	2.43	- 1.2	18 11.4	9 39.8	- 6 15.8	-1.1463	0.5526	0.0475	-51	-90
B. A. C. 5580	6½	2.40	+ 0.1	19 42.0	16 31.2	+ 0 22.1	+0.2159	0.5546	0.0356	+31	-24
29 Ophiuchi	6	2.28	1.1	18 42.6	29 1 43.6	+ 9 15.9	-1.1151	0.5573	0.0195	-51	-90
ξ Ophiuchi	5	+2.22	+ 2.9	-20 59.2	10 23.1	- 6 22.2	+1.2477	0.5591	-0.0045	+69	+56
B. A. C. 6060	6	1.98	4.1	18 46.7	30 2 11.1	+ 8 53.3	-0.9616	0.5622	+0.0250	-38	-90
B. A. C. 6098	6	1.97	5.1	20 44.1	5 8.7	+11 44.8	+1.2145	0.5635	0.0303	+70	+49
16 Sagittarii	6	1.90	5.6	20 25.1	10 46.6	- 6 49.0	+1.0752	0.5643	0.0411	+70	+32
B. A. C. 6294	6	1.78	5.6	18 28.8	18 2.0	+ 0 11.3	-0.6427	0.5654	0.0545	-15	-85
ρ^1 Sagittarii	4	+1.49	+ 7.3	-18 3.9	31 16 14.7	- 2 22.6	+0.5848	0.5678	+0.0944	+62	- 3
ρ^2 Sagittarii	5½	+1.50	+ 7.5	-18 31.3	16 18.3	- 2 19.2	+1.0683	0.5678	+0.0944	+72	+30
					APRIL.						
e^1 Sagittarii	6	+1.37	+ 7.2	-16 33.4	1 0 38.7	+ 5 43.6	-0.1338	0.5689	+0.1098	+18	-44
e^2 Sagittarii	5	1.35	7.3	16 23.6	1 26.2	+ 6 29.5	-0.2170	0.5689	0.1111	+14	-49
B. A. C. 6746	6	1.34	7.1	15 44.4	1 53.9	+ 6 56.2	-0.8451	0.5689	0.1114	-22	-90
g Sagittarii	5½	1.26	7.3	15 47.9	8 13.7	-10 57.4	-0.0432	0.5693	0.1216	+25	-38
β Capricorni	3	1.13	7.5	15 8.8	18 20.5	- 1 12.1	+0.5956	0.5701	0.1376	+67	- 3
B. A. C. 7087	6	+1.04	+ 7.4	-14 7.3	2 0 7.6	+ 4 22.7	+0.3624	0.5705	+0.1466	+51	-16
ν Aquarii	4½	0.85	6.9	11 50.5	15 37.3	- 4 40.5	+0.4722	0.5716	0.1679	+61	-10
14 Aquarii	6	0.81	6.4	9 42.0	18 35.0	- 1 49.1	-1.1959	0.5718	0.1714	-43	-90
17 Aquarii	6	0.80	6.4	9 49.0	21 28.4	+ 0 58.1	-0.5767	0.5722	0.1750	+ 1	-75
19 Aquarii	5½	0.79	6.4	10 14.7	22 27.5	+ 1 55.1	+0.0286	0.5722	0.1761	+34	-34
ξ Aquarii	5	+0.72	+ 5.9	- 8 22.4	3 3 55.8	+ 7 11.7	-0.8798	0.5727	+0.1819	-17	-90
B. A. C. 7562	6½	0.69	6.2	9 34.5	7 2.3	+10 11.5	+0.8999	0.5728	0.1850	+81	+17
c^1 Capricorni	5	0.69	6.2	9 37.0	7 4.3	+10 13.4	+0.9486	0.5728	0.1850	+81	+19
c^2 Capricorni	6	0.68	6.2	9 48.8	7 38.5	+10 46.3	+1.2497	0.5729	0.1858	+80	+46
30 Aquarii	5½	0.61	5.5	7 5.1	15 1.4	- 6 6.5	-0.0934	0.5738	0.1923	+29	-41
B. A. C. 7744	6	+0.58	+ 5.0	- 5 17.9	19 8.1	- 2 8.6	-1.0784	0.5747	+0.1955	-29	-90
44 Aquarii	5½	0.56	5.0	5 58.2	21 1.1	- 0 19.7	-0.0382	0.5749	0.1970	+33	-38
51 Aquarii	5	0.54	4.8	5 25.5	4 0 2.6	+ 2 35.3	+0.0199	0.5753	0.1992	+36	-35
κ Aquarii	5	0.49	4.4	- 4 49.7	5 55.7	+ 8 15.7	+0.6073	0.5763	0.2028	+77	- 3
κ Piscium	5½	0.39	2.7	+ 0 36.9	5 2 56.5	+ 4 30.7	-0.4247	0.5808	0.2093	+13	-62
9 Piscium	6	+0.39	+ 2.7	+ 0 38.9	3 4.5	+ 4 38.3	-0.4297	0.5808	+0.2093	+12	-63
15 Piscium	6½	+0.36	+ 2.6	+ 0 40.0	6 33.7	+ 7 59.9	+0.2800	0.5816	+0.2093	+52	-21

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
16 Piscium	6	+0.37	+ 2.4	+ 1 27.2	5 6 57.2	+ 8 22.6	−0.4110	0.5816	+0.2093	+14	−62
λ Piscium	5	0.35	2.5	1 8.2	9 20.5	+10 40.6	+0.4010	0.5821	0.2091	+61	−14
19 Piscium	6	0.36	+ 2.1	2 50.3	11 10.0	−11 33.9	−0.8866	0.5826	0.2088	−14	−87
				NEW	*MOON.*						
ο Arietis	6	+0.48	− 2.3	+14 48.8	8 11 25.5	+ 9 55.7	+0.5567	0.6016	+0.1343	+74	+ 3
σ Arietis	5½	0.48	2.5	14 35.9	14 9.7	−11 26.5	+1.1306	0.6017	0.1300	+90	+42
53 Arietis	6½	0.54	2.5	17 25.6	20 23.0	− 5 28.0	−0.8915	0.6025	0.1173	−16	−73
NEPTUNE				15 23.9	20 46.7	− 5 5.3	+1.1676	0.6050	0.1173	+90	+47
SATURN				17 5.0	9 7 55.7	+ 5 37.1	+0.6732	0.5984	0.0928	+89	+13
14 Tauri	6½	+0.67	− 3.3	+19 17.5	10 36.2	+ 8 11.4	−1.2779	0.6026	+0.0883	−62	−71
B. A. C. 1240	6	0.70	4.2	17 51.7	17 18.5	− 9 22.3	+0.6918	0.6023	0.0747	+90	+16
ω^1 Tauri	6	0.75	4.0	19 17.8	20 34.0	− 6 14.6	−0.5142	0.6016	0.0668	+ 7	−53
ε Tauri	3½	0.81	4.7	18 55.1	10 4 14.6	+ 1 7.8	+0.3137	0.6003	0.0507	+56	− 3
B. A. C. 1468	6	0.88	4.9	18 31.2	11 15.2	+ 7 51.9	+1.0155	0.5981	0.0349	+90	+41
i Tauri	5½	+0.90	− 5.6	+18 38.3	13 16.9	+ 9 48.9	+0.9642	0.5973	+0.0305	+90	+38
m Tauri	5½	0.96	6.2	18 29.1	19 41.4	− 8 1.6	+1.2700	0.5953	0.0157	+90	+70
l Tauri	5½	0.98	5.6	20 15.6	19 49.6	− 7 53.7	−0.5302	0.5953	+0.0156	+ 6	−51
127 Tauri	6½	1.11	7.5	18 55.3	11 10 5.0	+ 5 49.0	+0.8397	0.5891	−0.0149	+90	+31
χ^1 Orionis	4½	1.17	7.3	20 15.1	14 47.3	+10 20.6	−0.6212	0 5865	0.0249	0	−59
χ^2 Orionis	5	+1.17	− 7.5	+19 43.4	15 1.5	+10 34.3	−0.0824	0.5864	−0.0252	+31	−22
χ^3 Orionis	6	1.21	7.7	19 41.3	18 33.2	−10 2.1	−0.1497	0.5845	0.0329	+27	−27
χ^4 Orionis	5	1.21	7.5	20 8.3	18 44.2	− 9 51.5	−0.6212	0.5845	0.0330	0	−60
68 Orionis	6	1.24	7.8	19 48.8	22 7.7	− 6 35.5	−0.4086	0.5824	0.0397	+13	−44
71 Orionis	6	1.25	8.1	19 11.5	23 19.9	− 5 26.0	+0.1846	0.5818	0.0418	+47	− 9
ν Geminorum	4½	+1.33	− 8.2	+20 17.0	12 5 15.9	+ 0 17.0	−1.2334	0.5784	−0.0534	−52	−70
20 Geminorum	6½	1.31	9.1	17 51.4	6 43.7	+ 1 41.5	+1.2070	0.5775	0.0565	+90	+57
26 Geminorum	5½	1.37	9.5	17 45.3	11 3.9	+ 5 52.4	+1.0554	0.5745	0.0643	+90	+42
λ Geminorum	4	1.54	11.2	16 44.9	13 2 42.2	− 3 2.6	+0.8964	0.5618	0.0918	+90	+28
68 Geminorum	5½	1.60	11.8	16 4.5	9 40.8	+ 3 41.5	+0.9337	0.5605	0.1026	+90	+29
1 Cancri	6	+1.70	−12.3	+16 5.9	20 23.5	− 9 57.4	−0.2701	0.5539	−0.1181	+21	−43
27 Cancri	5½	1.83	14.1	13 2.1	14 10 27.6	+ 3 39.2	+1.2283	0.5451	0.1357	+90	+51
29 Cancri	6	1.85	13.7	14 35.6	11 20.3	+ 4 30.2	−0.5659	0.5448	0.1363	+ 4	−65
A^1 Cancri	6	1.91	14.5	13 5.8	18 24.4	+11 20.8	+0.0521	0.5408	0.1444	+39	−27
A^2 Cancri	6	1.92	14.8	12 32.1	20 14.3	−10 52.8	+0.3922	0.5396	0.1460	+61	− 9
60 Cancri	6	+1.96	−15.2	+12 4.0	15 0 39.3	− 6 36.1	+0.2435	0.5375	−0.1470	+50	−17
α Cancri	4	1.97	15.0	12 18.3	1 54.7	− 5 23.0	−0.2039	0.5369	0.1516	+24	−43
κ Cancri	5	1.99	15.4	11 8.0	6 31.6	− 0 54.7	+0.3563	0.5345	0.1559	+58	−12
ω Leonis	5½	2.09	16.3	9 33.6	16 57.7	+ 9 12.3	+0.3996	0.5298	0.1641	+61	−11
h Leonis	5½	2.10	16.1	10 13.6	18 44.1	+10 55.5	−0.6180	0.5292	0.1654	+ 2	−74
π Leonis	5	+2.22	−16.9	+ 8 36.0	16 9 17.9	+ 1 3.4	−1.3213	0.5236	−0.1742	−57	−82
14 Sextantis	6	2 24	17.5	6 10.6	12 45.2	+ 4 24.6	+0.7318	0.5226	0.1760	+90	+ 6
16 Sextantis	6	2.25	17.4	6 44.4	14 1.9	+ 5 39.0	−0.1117	0.5222	0.1766	+30	−41
19 Sextantis	6	2.27	17.8	5 11.2	15 54.6	+ 7 28.5	+1.2598	0.5217	0.1774	+90	+48
34 Sextantis	6½	2.39	18.0	4 11.3	17 7 40.2	− 1 13.2	−0.4800	0.5184	0.1828	+10	−66
36 Sextantis	6	+2.40	−18.3	+ 3 5.9	9 1.4	+ 0 5.6	+0.4746	0.5178	−0.1832	+66	−10
p^3 Leonis	6	2.47	18.1	2 35.1	20 40.0	+11 24.3	−1.1028	0.5162	0.1851	−30	−88
p^5 Leonis	5½	2.50	18.6	+ 0 33.7	18 0 20.3	− 9 1.5	+0.4539	0.5160	0.1855	+65	−11
υ Leonis	5	2.59	18.2	− 0 11.0	12 47.3	+ 3 4.3	−1.0299	0.5158	0.1853	−24	−90
f Virginis	6	2.80	17.1	5 11.6	19 20 51.0	+10 13.5	−1.2933	0.5187	0.1764	−52	−90
χ Virginis	5	+2.83	−17.2	− 7 21.3	22 3.9	+11 24.3	+0.8968	0.5192	−0.1758	+83	+15
28 Virginis	6	2.83	17.0	6 51.6	23 35.3	−11 7.0	+0.0797	0.5194	0.1749	+39	−31
ψ Virginis	5	2.88	16.9	8 54.5	20 6 8.4	− 4 45.0	+1.2210	0.5207	0.1716	+81	+42
B. A. C. 4394	6	2.92	16.0	8 21.7	13 36.4	+ 2 30.0	−0.6503	0.5226	0.1667	− 2	−83
50 Virginis	6	2.93	16.0	9 42.7	14 14.1	+ 3 6.6	+0.7466	0.5228	0.1665	+78	+ 6
56 Virginis	6½	+2.95	−15.8	− 9 45.2	16 50.7	+ 5 38.6	+0.3612	0.5235	−0.1646	+55	−16
58 Virginis	6	+2.95	−15.6	− 9 56.2	18 16.0	+ 7 1.4	+0.3315	0.5236	−0.1637	+52	−18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
62 Virginis	6½	+2.96	-15.6	-10 41.7	20 19 45.7	+ 8 28.6	+0.9298	0.5242	-0.1626	+80	+18
α Virginis	1	2.98	15.3	10 33.3	22 17.2	+10 55.6	+0.3648	0.5247	0.1610	+54	-16
86 Virginis	6	3 03	14.1	11 50.6	21 8 59.3	- 2 41.3	+0.1239	0.5280	0.1510	+39	-29
B. A. C. 4700	6	3.08	12.5	13 45.2	21 37.1	+ 9 33.9	+0.4010	0.5325	0.1393	+54	-14
λ Virginis	4½	3.07	11.8	12 50.1	22 1 49.7	-10 21.2	-1.1926	0.5335	0.1350	-46	-90
5 Libræ	6½	+3.13	- 9.9	-14 58.8	15 10.4	+ 2 34.9	-0.5158	0.5383	-0.1196	- 1	-70
α¹ Libræ	6	3.13	9.6	15 30.8	17 29.8	+ 4 50.0	-0.2008	0.5394	0.1162	+17	-48
α² Libræ	2½	3.14	9.6	15 33.5	17 35.5	+ 4 55.5	-0.1621	0.5396	0.1160	+18	-45
ν¹ Libræ	6	3.14	8.4	15 48.2	23 1 17.5	-11 36.8	-0.7485	0.5421	0.1063	-16	-90
ν² Libræ	6½	3.14	8.3	16 1.9	1 22.9	-11 31.5	-0.5058	0.5421	0.1063	- 2	-70
26 Libræ	6	+3.18	- 7.6	-17 20.0	5 6.9	- 7 54.6	+0.5459	0.5437	-0.1009	+60	- 5
28 Libræ	6½	3.17	7.0	17 44.1	8 10.2	- 4 57.1	+0.6869	0.5445	0.0968	+71	+ 3
ζ¹ Libræ	6½	3.13	6.5	16 18.6	11 44.2	- 1 29.9	-1.2187	0.5459	0.0912	-55	-90
ζ² Libræ	6	3.14	6.4	17 2.3	12 22.0	- 0 53.3	-0.4735	0.5459	0.0908	- 1	-67
ζ⁴ Libræ	6	3.13	6.2	16 27.4	13 58.3	+ 0 39.8	-1.2563	0.5465	0.0880	-61	-90
41 Libræ	6	+3.18	- 5.5	-18 55.0	16 46.9	+ 3 23.1	+1.2078	0.5476	-0.0838	+71	+46
47 Libræ	6½	3.17	4.4	19 2.2	24 0 25.7	+10 47.0	+0.7430	0.5502	0.0717	+71	+ 7
β¹ Scorpii	2	3.16	3.3	19 29.1	5 20.1	- 8 28.2	+0.8991	0.5513	0.0645	+71	+18
β² Scorpii	5½	3.17	3.3	19 29.0	5 20.3	- 8 28.0	+0.8972	0.5513	0.0645	+71	+17
ν² Scorpii	4	3.13	2.9	19 8.8	8 24.6	- 5 29.7	+0.3396	0.5526	0.0588	+41	-17
ν¹ Scorpii	6	+3.13	- 2.9	-19 9.3	8 24.7	- 5 29.6	+0.3487	0.5526	-0.0588	+41	-16
ψ Ophiuchi	5	3.12	1.9	19 45.7	14 3.7	- 0 1.7	+0.7055	0.5540	0.0498	+69	+ 5
χ Ophiuchi	6	3.08	2.0	18 11.4	15 27.1	+ 1 19.0	-1.0807	0.5546	0.0470	-45	-90
B. A. C. 5580	6½	3.07	- 0.4	19 42.0	22 18.3	+ 7 56.4	+0.2837	0.5560	0.0360	+35	-20
29 Ophiuchi	6	2.99	+ 0.8	18 42.6	25 7 30.9	- 7 9.4	-1.0459	0.5582	-0.0190	-45	-90
B. A. C. 6060	6	+2.78	+ 4.9	-18 46.7	26 8 5.3	- 7 25.0	-0.8911	0.5618	+0.0252	-33	-90
16 Sagittarii	6	2.73	6.5	20 25.1	16 45.6	+ 0 57.5	+1.1617	0.5630	0.0412	+70	+41
B. A C. 6294	6	2.61	6.9	18 28.8	27 0 6.0	+ 8 2.9	-0.5674	0.5630	0.0542	-10	-75
ρ¹ Sagittarii	4	2.32	9.4	18 3.8	22 40.6	+ 5 50.9	+0.6688	0.5630	0.0941	+69	+ 2
ρ² Sagittarii	5½	2.32	9.6	18 31.2	22 44.3	+ 5 54.4	+1.1577	0.5630	0.0941	+72	+39
e¹ Sagittarii	6	+2.20	+ 9.7	-16 33.3	28 7 15.6	- 9 52.0	-0.0580	0.5631	+0.1077	+22	-39
e² Sagittarii	5	2.18	9.7	16 23.5	8 4.3	- 9 4.9	-0.1423	0.5630	0.1092	+18	-44
B. A. C. 6746	6	2.17	9.5	15 44.3	8 32.5	- 8 37.7	-0.7780	0.5629	0.1105	-17	-90
g Sagittarii	5½	2.08	9.9	15 47.8	15 1.4	- 2 22.2	+0.0315	0.5625	0.1202	+29	-34
β Capricorni	3	1.93	10.5	15 8.7	29 1 24.2	+ 7 39.2	+0.6782	0.5620	0.1361	+73	+ 2
B. A. C. 7087	6	+1.84	+10.6	-14 7.2	7 21.5	-10 35.7	+0.4423	0.5622	+0.1440	+57	-11
ν Aquarii	4½	1.62	10.5	11 50.4	23 20.4	+ 4 50.3	+0.5483	0.5623	0.1643	+67	- 6
14 Aquarii	6	1.57	9 9	9 41.9	30 2 23.9	+ 7 47.4	-1.1460	0.5624	0.1683	-38	-90
17 Aquarii	6	1.54	10.0	9 48.9	5 23.1	+10 40.5	-0.5190	0.5624	0.1716	+ 4	-70
19 Aquarii	5½	1.51	10.0	10 14.6	6 24.0	+11 39.3	+0.0942	0.5624	0.1727	+38	-31
ξ Aquarii	5	+1.45	+ 9.4	- 8 22.3	12 3.6	- 6 52.7	-0.8310	0.5627	+0.1781	-13	-90
B. A. C. 7562	6½	1.41	9.8	9 34.4	15 16.6	- 3 46.3	+0.9777	0.5630	0.1812	+81	+21
c¹ Capricorni	5	1.41	9.8	9 36.9	15 18.7	- 3 44.3	+1.0252	0.5630	0.1812	+81	+24
30 Aquarii	5½	+1.30	+ 9.0	- 7 5.2	23 32.3	+ 4 12.3	-0.0305	0.5636	+0.1884	+33	-37

MAY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
B. A. C. 7744	6	+1.24	+ 8.4	- 5 17.9	1 3 47.6	+ 8 18.7	-1.0382	0.5643	+0.1918	-26	-90
44 Aquarii	5½	1.23	8.5	5 58.2	5 44.5	+10 11.6	+0.0186	0.5645	0.1931	+36	-35
51 Aquarii	5	1.19	8.4	5 25.5	8 52.5	-10 46.9	+0.0725	0.5649	0.1951	+39	-32
κ Aquarii	5	+1.12	+ 8.0	- 4 49.7	14 57.7	- 4 54.4	+0.6706	0.5661	+0.1986	+83	+ 1
κ Piscium	5½	0.93	5.6	+ 0 37.0	2 12 39.7	- 7 58.1	-0.3924	0.5712	0.2053	+15	-60
9 Piscium	6	0.93	5.6	0 39.0	12 48.0	- 7 50.1	-0.2311	0.5715	0.2053	+23	-49
15 Piscium	6½	0.88	5.4	0 40.1	16 23.5	- 4 22.2	+0.3222	0.5728	0.2056	+55	-18
16 Piscium	6	0.89	5.1	1 27.3	16 47.7	- 3 58.8	-0.3785	0.5728	0.2056	+15	-59
λ Piscium	5	+0.86	+ 5.3	+ 1 8.3	19 15.2	- 1 36.6	+0.4411	0.5733	+0.2053	+64	-12
19 Piscium	6	+0.86	+ 4.8	+ 2 50.4	21 7.9	+ 0 12.1	-0.8668	0.5741	+0.2053	-13	-87

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
22 Piscium	6½	+0.83	+ 4.7	+ 2 16.9	2 23 32.0	+ 2 31.0	+0.1821	0.5748	+0.2049	+46	-26
25 Piscium	6	0.83	4.9	1 26.5	3 0 0.7	+ 2 58.6	+1.1140	0.5750	0.2049	+90	+31
51 Piscium	6	0.71	2.9	6 18.7	16 46.4	- 4 52.2	-0.3176	0.5816	0.1988	+18	-54
60 Piscium	6½	0.67	2.4	6 6.2	23 4.4	+ 1 11.8	+1.1272	0.5841	0.1949	+90	+34
62 Piscium	6	0.68	2.2	6 39 7	23 26.4	+ 1 33.1	+0.6473	0.5844	0.1943	+82	+ 1
δ Piscium	4½	+0.67	+ 2.0	+ 6 56.8	23 36.3	+ 1 42.6	+0.3977	0.5844	+0.1943	+60	-12
ε Piscium	4	0.65	+ 1.7	7 15.6	4 5 32.6	+ 7 25.6	+1.2308	0.5872	0.1896	+90	+45
				NEW	*MOON.*						
ε Tauri	3½	0.65	- 5.3	18 55.1	7 14 40.0	-10 38.5	+0.2942	0.6073	0.0504	+54	- 4
B. A. C. 1468	6	+0.69	- 5.8	+18 31.2	21 31.4	- 4 3.7	+0.9858	0.6061	+0.0345	+90	+39
i Tauri	5½	0.70	6.0	18 38.3	23 30.3	- 2 9.5	+0.9335	0.6056	0.0301	+90	+36
m Tauri	5½	0.73	6.5	18 29.1	8 5 45.6	+ 3 50.7	+1.2362	0.6038	0.0159	+90	+65
l Tauri	5½	0.74	6.2	20 15.6	5 53.7	+ 3 58.5	-0.5463	0.6038	+0.0158	+ 5	-52
119 Tauri	5	0.80	7.2	18 30.2	15 32.1	-10 46.0	+1.2723	0.6002	-0.0064	+90	+71
127 Tauri	6½	+0.82	- 7.4	+18 55.3	19 46.5	- 6 41.5	+0.8076	0.5984	-0.0155	+90	+29
χ^1 Orionis	4½	0.86	7.5	20 15.1	9 0 21.1	- 2 17.6	-0.6371	0.5964	0.0249	- 1	-61
χ^2 Orionis	5	0.86	7.6	19 43.4	0 34.6	- 2 4.6	-0.1068	0.5960	0.0261	+30	-24
χ^3 Orionis	6	0.89	7.9	19 41.3	4 0.5	+ 1 13.3	-0.1716	0.5943	0.0331	+26	-28
χ^4 Orionis	5	0.89	7.8	20 8.3	4 11.1	+ 1 23.5	-0.6352	0.5943	0.0333	- 1	-61
68 Orionis	6	+0.92	- 8.1	+19 48.8	7 28.6	+ 4 33.5	-0.4273	0.5920	-0.0409	+12	-45
71 Orionis	6	0.92	8.2	19 11 5	8 38.8	+ 5 41.0	+0.1567	0.5913	0.0431	+45	-10
ν Geminorum	4½	0.98	8.5	20 17.0	14 24.3	+11 13.4	-1.2428	0.5880	0.0551	-54	-70
20 Geminorum	6½	0.97	9.2	17 51.4	15 49.7	-11 24.5	+1.1673	0.5874	0.0575	+90	+53
26 Geminorum	5½	1.00	9.5	17 45.3	20 1.9	- 7 21.7	+1.0162	0.5848	0.0651	+90	+39
λ Geminorum	4	+1.12	-10.6	+16 44.9	10 11 13.2	+ 7 16.3	+0.8602	0.5745	-0.0926	+90	+25
68 Geminorum	5½	1.19	11.1	16 4.5	17 59.8	-10 11.6	+0.8991	0.5697	0.1039	+90	+26
1 Cancri	6	1.29	11.6	16 5.9	11 4 24.9	- 0 8.2	-0.2876	0.5614	0.1198	+20	-44
5 Cancri	6½	1.32	11.4	16 46.5	6 26.5	+ 1 49.2	-1.2488	0.5598	0.1225	-50	-73
12 Cancri	6½	1.33	12.5	13 58.6	9 46.7	+ 5 2.6	+1.2885	0.5577	0.1268	+90	+63
27 Cancri	5½	+1.40	-13.1	+13 2.1	18 7.8	-10 53.0	+1.1910	0.5524	-0.1370	+90	+46
29 Cancri	6	1.42	12.7	14 35.6	18 59.0	-10 3.4	-0.5824	0.5518	0.1380	+ 3	-66
A¹ Cancri	6	1.48	13.4	13 5.8	12 1 53.5	- 3 22.4	+0.0320	0.5470	0.1456	+38	-28
A² Cancri	6	1.49	13.6	12 32.1	3 40.8	- 1 38.6	+0.3684	0.5454	0.1476	+59	-10
60 Cancri	6	1.53	13.8	12 4.1	8 0.3	+ 2 32.6	+0.2212	0.5432	0.1517	+49	-19
α Cancri	4	+1.54	-13.9	+12 18.4	9 14.0	+ 3 44.0	-0.2232	0.5423	-0.1529	+23	-44
κ Cancri	5	1.58	14.3	11 8.1	13 45.6	+ 8 7.0	+0.3331	0.5396	0.1570	+56	-13
ω Leonis	5½	1.69	15.0	9 33.6	13 0 0.5	- 5 57.3	+0.3798	0.5342	0.1651	+59	-12
3 Leonis	6	1.68	15.3	8 41.6	0 2.2	- 5 55.7	+1.3107	0.5342	0.1651	+90	+60
h Leonis	5½	1.71	14.8	10 13.7	1 45.1	- 4 15.9	-0.6325	0.5329	0.1665	+ 1	-75
π Leonis	5	+1.84	-15.3	+ 8 36.0	16 6.5	+ 9 39.5	-1.3262	0.5265	-0.1749	-60	-82
14 Sextantis	6	1.87	16.3	6 10.6	19 31.4	-11 1.7	+0.7138	0.5248	0.1766	+90	+ 5
16 Sextantis	6	1.89	16.1	6 44.4	20 47.1	- 9 48.2	-0.1236	0.5242	0.1772	+29	-42
19 Sextantis	6	1.91	16.6	5 11.2	22 38.7	- 7 59.8	+1.2405	0.5237	0.1780	+90	+45
34 Sextantis	6½	2.06	16.7	4 11.3	14 14 16.2	+ 7 10.4	-0.4867	0.5194	0.1830	+ 9	-66
36 Sextantis	6	+2.07	-17.1	+ 3 5.9	15 36.7	+ 8 28.5	+0.4631	0.5186	-0.1834	+65	-10
p^3 Leonis	6	2.20	16.9	2 35.1	15 3 11.6	- 4 16.5	-1.1054	0.5162	0.1849	-30	-88
p^5 Leonis	5½	2.24	17.4	+ 0 33.7	6 50.9	- 0 43.4	+0.4466	0.5157	0.1851	+64	-11
υ Leonis	5	2.35	17.1	- 0 11.0	19 16.3	+11 20.8	-1.0301	0.5148	0.1848	-24	-90
f Virginis	6	2.68	16.5	5 11.6	17 3 19.7	- 5 30.3	-1.2927	0.5175	0.1759	-53	-90
χ Virginis	5	+2.71	-16.9	- 7 21.3	4 32.4	- 4 19.7	+0.8933	0.5180	-0.1752	+83	+15
28 Virginis	6	2.72	16.6	6 51.6	6 4.1	- 2 50.7	+0.0777	0.5180	0.1746	+39	-31
ψ Virginis	5	2.80	16.4	8 54.5	12 37.4	+ 3 31.4	+1.2170	0.5194	0.1709	+81	+42
B. A. C. 4394	6	2.85	15.6	8 21.7	20 5.9	+10 46.9	-0.6510	0.5213	0.1666	- 2	-83
50 Virginis	6	2.87	15.8	9 42.7	20 43.5	+11 23.4	+0.7416	0.5217	0.1661	+79	+ 5
56 Virginis	6½	+2.90	-15.5	- 9 45.2	23 20.3	-10 4.4	+0.3570	0.5222	-0.1646	+54	-16
58 Virginis	6	+2.91	-15.7	- 9 56.2	18 0 45.4	- 8 41.7	+0.3292	0.5228	-0.1635	+52	-18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
62 Virginis	6½	+2.94	-15.6	-10 41.7	18 2 15.3	- 7 14.4	+0.9264	0.5230	-0.1626	+80	+17
α Virginis	1	2.96	15.1	10 33.2	4 46.7	- 4 47.5	+0.3606	0.5240	0.1605	+54	-16
86 Virginis	6	3.06	14.1	11 50.6	15 28.7	+ 5 35.6	+0.1182	0.5276	0.1515	+38	-29
B. A. C. 4700	6	3.18	12.8	13 45.2	19 4 5.7	- 6 10.0	+0.3965	0.5322	0.1397	+54	-14
λ Virginis	4½	3.18	12.0	12 50.1	8 17.8	- 2 5.5	-1.1978	0.5339	0.1354	-47	-90
5 Libræ	6½	+3 32	-10.2	-14 58.8	21 35.8	+10 47.9	-0.5240	0.5395	-0.1195	- 1	-71
α^1 Libræ	6	3.34	9.9	15 30.8	23 54.7	-10 57.5	-0.2095	0.5403	0.1168	+16	-48
α^2 Libræ	2½	3.34	9.9	15 33.5	20 0 0.3	-10 52.2	-0.1709	0.5405	0.1167	+18	-46
ν^1 Libræ	6	3.37	8.6	15 48.2	7 40.1	- 3 26.8	-0.7558	0.5436	0.1064	-16	-90
ν^2 Libræ	6½	3.37	8.7	16 1.9	7 45.5	- 3 21.5	-0.5135	0.5436	0.1064	- 2	-71
26 Libræ	6	+3.43	- 8.2	-17 20.0	11 28.2	+ 0 14.1	+0.5333	0.5451	-0.1010	+59	- 6
28 Libræ	6½	3.46	7.7	17 44.1	14 30.5	+ 3 10.6	+0.6719	0.5462	0.0969	+70	+ 2
ζ^1 Libræ	6½	3.45	6.8	16 18.6	18 3.3	+ 6 36.6	1.2274	0.5474	0.0920	-56	-90
ζ^3 Libræ	6	3.46	6.9	17 2.3	18 40.7	+ 7 12.8	-0.4829	0.5476	0.0909	- 2	-68
ζ^4 Libræ	6	3.46	6.5	16 27.4	20 16.6	+ 8 45.6	-1.2650	0.5479	0.0888	-63	-90
41 Libræ	6	+3.52	- 6.2	-18 55.0	23 3.9	+11 27.5	+1.1890	0.5492	-0.0846	+71	+43
47 Libræ	6½	3.55	4.8	19 2.1	21 6 39.3	- 5 11.9	+0.7221	0.5525	0.0724	+71	+ 6
β^1 Scorpii	2	3.56	3.7	19 29.0	11 31.3	- 0 29.5	+0.8780	0.5545	0.0645	+71	+16
β^2 Scorpii	5½	3.56	3.7	19 28.9	11 31.5	- 0 29.3	+0.8762	0.5545	0.0645	+71	+16
ν^1 Scorpii	6	3.56	3.1	19 8.8	14 34.4	+ 2 27.6	+0.3203	0.5555	0.0595	+40	-18
ν^2 Scorpii	4	+3.56	- 3.1	-19 9.3	14 34.4	+ 2 27.6	+0.3294	0.5555	-0.0595	+40	-17
ψ Ophiuchi	5	3.58	2.1	19 45.7	20 10.5	+ 7 52.6	+0.6814	0.5569	0.0505	+67	+ 3
χ Ophiuchi	6	3.54	1.8	18 11.4	21 33.2	+ 9 12.5	-1.0990	0.5576	0.0476	-47	-90
B. A. C. 5580	6½	3.56	- 0.6	19 42.0	22 4 20.6	- 8 13.8	+0.2610	0.5597	0.0357	+34	-21
29 Ophiuchi	6	3.52	+ 1.2	18 42.6	13 28.0	+ 0 35.1	-1.0683	0.5619	-0.0195	-47	-90
B. A. C. 6060	6	+3.43	+ 5.9	-18 46.7	23 13 48.9	+ 0 5.9	-0.9234	0.5653	+0.0250	-35	-90
16 Sagittarii	6	3.41	7.5	20 25.1	22 24.9	+ 8 24.1	+1.1246	0.5662	0.0415	+70	+37
B. A. C. 6294	6	3.32	8.5	18 28.8	24 5 42.4	- 8 33.4	-0.6061	0.5659	0.0542	-13	-81
ρ^1 Sagittarii	4	3.11	11.7	18 3.8	25 4 11.3	-10 51.2	+0.6223	0.5648	0.0935	+65	- 1
ρ^2 Sagittarii	5½	3.13	11.8	18 31.2	4 14.9	-10 47.8	+1.1120	0.5648	0.0937	+72	+35
e^1 Sagittarii	6	+3.00	+12.6	-16 33.3	12 45 8	- 2 34.5	-0.1092	0.5639	+0.1080	+20	-42
e^2 Sagittarii	5	2.98	12.8	16 23.5	13 34.5	- 1 47.4	-0.1937	0.5639	0.1095	+15	-48
B. A. C. 6746	6	2.96	12.5	15 44.3	14 2.9	- 1 19.9	-0.8329	0.5637	0.1099	-21	-90
g Sagittarii	5½	2.89	13.3	15 47.8	20 32.4	+ 4 56.1	-0.0211	0.5628	0.1203	+26	-37
β Capricorni	3	2.76	14.1	15 8.7	26 6 58.3	- 8 59.3	+0.6260	0.5615	0.1354	+69	- 1
B. A. C. 7087	6	+2.67	+14.3	-14 7.2	12 58.0	- 3 11.8	+0.3873	0.5606	+0.1435	+53	-14
ν Aquarii	4½	2.46	14.6	11 50.4	27 5 7.5	-11 35.3	+0.4920	0.5588	0.1632	+62	- 9
14 Aquarii	6	2.41	14.1	9 41.9	8 13.7	- 8 35.4	-1.2196	0.5584	0.1666	-46	-90
17 Aquarii	6	2.37	14.3	9 48.9	11 15.7	- 5 39.5	-0.5875	0.5584	0.1697	0	-76
19 Aquarii	5½	2.36	14.4	10 14.6	12 17.7	- 4 49.6	+0.0328	0.5582	0.1708	+34	-34
ξ Aquarii	5	+2.27	+14.0	- 8 22.3	18 3.1	+ 0 54.1	-0.9026	0.5577	+0.1764	-18	-90
B. A. C. 7562	6½	2.24	14.5	9 34.4	21 19.7	+ 4 4.1	+0.9222	0.5577	0.1793	+81	+17
c^1 Capricorni	5	2.24	14.5	9 36.9	21 21.8	+ 4 6.2	+0.9720	0.5577	0.1793	+81	+20
c^2 Capricorni	6	2.23	14.6	9 48.7	21 57.8	+ 4 41.0	+1.2829	0.5577	0.1801	+81	+51
30 Aquarii	5½	2.13	13.9	7 5.0	28 5 45.8	-11 46.8	-0.1012	0.5577	0.1864	+29	-42
B. A. C. 7744	6	+2.07	+13.2	- 5 17.8	10 7.2	- 7 34.2	-1.1192	0.5577	+0.1892	-33	-90
44 Aquarii	5½	2.04	13.5	5 58.1	12 6.8	- 5 38.6	-0.0479	0.5577	0.1906	+32	-39
51 Aquarii	5	2.00	13.3	5 25.4	15 19.5	- 2 32.4	+0.0085	0.5577	0.1924	+35	-35
κ Aquarii	5	1.92	12.9	- 4 49.6	21 34.1	+ 3 29.6	+0.6096	0.5582	0.1960	+77	- 3
κ Piscium	5½	1.69	10.4	+ 0 37.1	29 19 55.0	+ 1 4.8	-0.4642	0.5618	0.2020	+11	-65
9 Piscium	6	+1.69	+10.4	+ 0 39.1	20 3.6	+ 1 13.1	-0.3005	0.5618	+0.2022	+19	-54
15 Piscium	6½	1.63	10.2	0 40.2	23 46.1	+ 4 48.1	+0.2629	0.5630	0.2023	+51	-21
16 Piscium	6	1.64	9.9	1 27.4	30 0 11.0	+ 5 12.2	-0.4501	0.5630	0.2023	+11	-64
λ Piscium	5	1.62	9.8	1 8.4	2 43.2	+ 7 39.1	+0.3839	0.5636	0.2022	+59	-15
19 Piscium	6	1.61	9.1	2 50.5	4 39.7	+ 9 31.6	-0.9421	0.5643	0.2018	-18	-87
22 Piscium	6½	+1.57	+ 9.2	+ 2 17.0	7 8.6	+11 55.3	+0.1227	0.5649	+0.2017	+43	-29
25 Piscium	6	+1.56	+ 9.4	+ 1 26.6	7 38.2	-11 36.1	+1.0691	0.5653	+0.2016	+90	+27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
51 Piscium	6	+1.40	+ 6.8	+ 5 56.1	31 0 58.0	+ 5 7.2	-0.3793	0.5711	+0.1956	+15	-58
60 Piscium	6½	1.34	6.3	7 11.7	7 28.4	+11 23.7	+1.0909	0.5742	0.1919	+90	+31
62 Piscium	6	1.34	6.1	7 16.1	7 51.2	+11 45.7	+0.6056	0.5742	0.1917	+78	- 1
δ Piscium	4½	1.34	6.0	7 18.1	8 1.6	+11 55.8	+0.3537	0.5744	0.1915	+57	-15
ε Piscium	4	+1.27	+ 5.4	+ 8 27.7	14 9.7	- 6 9.4	+1.1992	0.5769	+0.1914	+90	+42
JUNE.											
π Piscium	5½	+1.19	+ 3.0	+11 32.7	1 4 34.2	+ 7 43.4	-0.4766	0.5838	+0.1729	+10	-61
B. A. C. 609	6	1.11	2.1	11 43.6	13 49.6	- 7 22.0	+0.8923	0.5883	0.1617	+90	+20
19 Arietis	5½	+1.10	+ 0.8	+14 43.8	19 22.7	- 2 1.5	-1.2184	0.5909	+0.1537	-44	-76
29 Arietis	6½	1.04	0.0	14 30.9	2 3 26.4	+ 5 43.8	+0.1890	0.5947	0.1414	+47	-18
ο Arietis	6	1.01	- 0.4	14 48.8	8 7.4	+10 14.0	+0.5369	0.5964	0.1341	+72	+ 1
σ Arietis	5½	0.99	0.7	14 35.9	10 54.2	-11 5.8	+1.1171	0.5977	0.1290	+90	+41
53 Arietis	6½	0.98	1.9	17 25.6	17 12.6	- 5 2.1	-0.9168	0.5999	+0.1179	-18	-73
				NEW	*MOON.*						
ν Geminorum	4½	+0.91	- 8.6	+20 16.9	6 0 25.9	- 0 56.9	-1.1773	0.5926	-0.0550	-43	-70
20 Geminorum	6½	0.90	9.0	17 51.4	1 50.0	+ 0 23.9	+1.2210	0.5926	0.0569	+90	+59
26 Geminorum	5½	0.92	9.2	17 45.3	5 58 6	+ 4 23.1	+1.0752	0.5906	0.0654	+90	+43
λ Geminorum	4	+0.96	-10.1	+16 44.9	20 53.2	- 5 15.6	+0.9311	0.5809	-0.0933	+90	+30
68 Geminorum	5½	0.99	10.6	16 4.5	7 3 31.6	+ 1 8.3	+0.9731	0.5765	0.1047	+90	+31
f Geminorum	6	1.02	10.3	17 56.2	6 1.5	+ 3 32.8	-1.2255	0.5749	0.1086	-48	-72
1 Cancri	6	1.05	11.0	16 5.9	13 43.3	+10 58.2	-0.1964	0.5692	0.1205	+25	-38
5 Cancri	6½	1.07	10.8	16 46.5	15 42.2	-11 7.1	-1.1455	0.5676	0.1232	-37	-74
27 Cancri	5½	+1.14	-12.0	+13 2.1	8 3 7.4	- 0 5.4	+1.2814	0.5597	-0.1381	+90	+59
29 Cancri	6	1.16	11.7	14 35.6	3 57.6	+ 0 43.1	-0.4735	0.5589	0.1397	+10	-58
A¹ Cancri	6	1.21	12.3	13 5.8	10 42.3	+ 7 14.2	+0.1356	0.5541	0.1470	+44	-23
A² Cancri	6	1.22	12.4	12 32.1	12 27.2	+ 8 55.7	+0.4725	0.5529	0.1492	+67	- 5
60 Cancri	6	1.26	12.7	12 4.1	16 40.8	-10 59.1	+0.3288	0.5503	0.1535	+56	-13
α Cancri	4	+1.26	-12.7	+12 18.4	17 52.8	- 9 49.4	-0.1096	0.5495	-0.1544	+30	-37
κ Cancri	5	1.29	13.1	11 8.1	22 18.2	- 5 32.6	+0.4450	0.5470	0.1584	+64	- 7
ω Leonis	5½	1.38	13.7	9 33.7	9 8 19.6	+ 4 9.7	+0.4940	0.5405	0.1665	+68	- 6
h Leonis	5½	1.39	13.5	10 13.7	10 1.9	+ 5 48.8	-0.5052	0.5394	0.1680	+ 8	-65
B. A. C. 3407	6	1.52	13.8	8 52.0	23 2.5	- 5 34.8	-1.2871	0.5325	0.1760	-51	-81
π Leonis	5	+1.53	-13.9	+ 8 36.1	10 0 5.9	- 4 33.3	-1.1888	0.5320	-0.1764	-38	-82
14 Sextantis	6	1.56	14.6	6 10.7	3 26.8	- 1 18.5	+0.8339	0.5299	0.1781	+90	+12
16 Sextantis	6	1.58	14.5	6 44.5	4 41.2	- 0 6.3	+0.0036	0.5295	0.1786	+36	-34
34 Sextantis	6½	1.75	14.9	4 11.4	21 52.9	- 7 25.3	-0.3523	0.5225	0.1841	+17	-57
36 Sextantis	6	1.77	15.2	3 5.9	23 12.4	- 6 8.1	+0.5942	0.5225	0.1844	+76	- 3
p^3 Leonis	6	+1.89	-15.2	+ 2 35.1	11 10 38.1	+ 4 57.7	-0.9652	0.5200	-0.1859	-20	-88
p^5 Leonis	5½	1.93	15.8	+ 0 33 7	14 15.0	+ 8 28.4	+0.5809	0.5183	0.1861	+75	- 4
υ Leonis	5	2.06	15.4	- 0 11.0	12 2 33.2	- 3 34.6	-0.8913	0.5164	0.1854	-15	-90
f Virginis	6	2.45	15.1	5 11.6	13 10 27.7	+ 3 25.4	-1.1655	0.5168	0.1759	-37	-90
χ Virginis	5	2.48	15.8	7 21.3	11 40.5	+ 4 36.1	+1.0141	0.5170	0.1756	+83	+23
28 Virginis	6	+2.49	-15.4	- 6 51.6	13 12.1	+ 6 5.0	+0.1992	0.5171	-0.1749	+46	-25
ψ Virginis	5	2 61	15.5	8 54.5	19 45.1	-11 33.2	+1.3320	0.5183	0.1712	+81	+62
B. A. C. 4394	6	2.67	14.4	8 21.6	14 3 13.7	- 4 17.6	-0.5367	0.5198	0.1667	+ 4	-71
50 Virginis	6	2.70	14.8	9 42.6	3 51.2	- 3 41.2	+0.8541	0.5202	0.1662	+81	+12
56 Virginis	6½	2.73	14.5	9 45.1	6 28.0	- 1 9.0	+0.4668	0.5210	0.1643	+62	-10
58 Virginis	6	+2.74	-14.6	- 9 56.1	7 53.3	+ 0 13.8	+0.4372	0.5213	-0.1635	+60	-12
62 Virginis	6½	2.76	14.5	10 41.6	9 23.3	+ 1 41.3	+1.0330	0.5218	0.1624	+80	+25
α Virginis	1	2.79	14.2	10 33.2	11 55.0	+ 4 8.5	+0.4686	0.5223	0.1607	+62	-10
h Virginis	5	2.83	13.4	9 33.9	15 57.8	+ 8 4.2	-1.2671	0.5236	0.1575	-52	-90
86 Virginis	6	2.93	13.3	11 50.6	22 38.0	- 9 27.4	+0.2194	0.5261	0.1519	+44	-24
B. A. C. 4700	6	+3.10	-12.3	-13 45.2	15 11 16.5	+ 2 48.4	+0.4843	0.5307	-0.1403	+60	- 9
λ Virginis	4½	+3.12	-11.2	-12 50.1	15 28.9	+ 6 53.2	-1.1115	0.5325	-0.1354	-38	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
5 Libræ	6½	+3.19	-11.0	-14 58.8	16 4 48.3	- 4 12.0	-0.4515	0.5383	-0.1204	+ 3	-65
α^1 Libræ	6	3.34	9.6	15 30.8	7 7.3	- 1 57.3	-0.1413	0.5389	0.1178	+19	-44
α^2 Libræ	2½	3.34	9.6	15 33.5	7 13.0	- 1 51.8	-0.1027	0.5389	0.1178	+22	-42
ν^1 Libræ	6	3.42	8.4	15 48.2	14 53.0	+ 5 33.8	-0.6939	0.5426	0.1075	-12	-90
ν^2 Libræ	6½	3.43	8.4	16 1.9	14 58.3	+ 5 39.0	-0.4522	0.5425	0.1073	+ 2	-65
26 Libræ	6	+3.48	- 8.1	-17 20.0	18 41.1	+ 9 14.7	+0.5871	0.5444	-0.1022	+63	- 3
28 Libræ	6½	3.51	7.6	17 44.1	21 43.1	-11 49.1	+0.7236	0.5458	0 0980	+73	+ 5
ζ^1 Libræ	6½	3.51	6 5	16 18.6	17 1 15.8	- 8 23.2	-1.1757	0.5473	0.0933	-49	-90
ζ^2 Libræ	6	3.53	6.6	17 2.3	1 53.1	- 7 47.1	-0.4362	0.5475	0.0922	+ 1	-64
ζ^4 Libræ	6	3.53	6.2	16 27.4	3 28.7	- 6 14.7	-1.2170	0.5486	0.0894	-55	-90
41 Libræ	6	+3.62	- 6.1	-18 55.0	6 15.9	- 3 32.8	+1.2306	0.5492	-0.0859	+71	+50
47 Libræ	6½	3.69	4.7	19 2.2	13 50.1	+ 3 46.5	+0.7549	0.5529	0.0739	+71	+ 8
β^1 Scorpii	2	3.74	3.6	19 29.1	18 41.0	+ 8 27.8	+0.9042	0.5549	0.0659	+71	+18
β^2 Scorpii	5½	3.74	3.6	19 29.0	18 41.1	+ 8 27.9	+0.9005	0.5549	0.0659	+71	+18
ν^2 Scorpii	4	3.75	3.0	19 9.4	21 43.3	+11 24.1	+0.3538	0.5563	0.0610	+41	-16
ν^1 Scorpii	6	+3.75	- 3.0	-19 8.9	21 43.4	+11 24.2	+0.3446	0.5563	-0.0610	+42	-16
ψ Ophiuchi	5	3.79	2.0	19 45.7	18 3 17.7	- 7 12.7	+0.6971	0.5582	0.0520	+68	+ 4
χ Ophiuchi	6	3.76	1.5	18 11.4	4 39.9	- 5 53.2	-1.0804	0.5590	0.0492	-45	-90
B. A. C. 5580	6½	3.83	- 0.2	19 42.0	11 24.5	+ 0 37.7	+0.2672	0.5615	0.0372	+34	-21
29 Ophiuchi	6	3.85	+ 1.7	18 42.6	20 27.7	+ 9 22.4	-1.0688	0.5644	-0.0209	-47	-90
B. A. C. 6060	6	+3.86	+ 6.7	-18 46.7	19 20 32.6	+ 8 37.2	-0.9557	0.5697	+0.0243	-38	-90
B. A. C. 6098	6	3.91	7.4	20 44.1	23 27.9	+11 26.4	+1.2128	0.5701	0.0299	+70	+49
16 Sagittarii	6	3.90	8.5	20 25.1	20 5 1.9	- 7 11.2	+1.0678	0.5705	0.0398	+70	+32
B. A C. 6294	6	3.83	9.9	18 28.7	12 13.0	- 0 15.2	-0.6627	0.5709	0.0532	-16	-88
Lalande 35497	6	3.80	12.5	19 24.6	21 2 7.0	-10 50.6	+1.2445	0.5707	0.0788	+71	+53
ρ^1 Sagittarii	4	+3.73	+13.9	-18 3.8	10 21.0	- 2 54.0	+0.5307	0.5705	+0.0931	+57	- 6
ρ^2 Sagittarii	5½	3.74	13.9	18 31.2	10 24.6	- 2 50.5	+1.0172	0.5702	0.0938	+72	+26
e^1 Sagittarii	6	3.64	15.0	16 33.3	18 47.3	+ 5 14.5	-0.2084	0.5694	0.1077	+14	-48
e^2 Sagittarii	5	3.64	15.2	16 23.5	19 35.3	+ 6 0.9	-0.2925	0.5693	0.1092	+10	-54
B. A. C. 6746	6	3.61	15.1	15 44.3	20 3.2	+ 6 27.8	-0.9279	0.5693	0.1095	-27	-90
g Sagittarii	5½	+3.58	+16.0	-15 47.7	22 2 26.7	-11 22.2	-0.1327	0.5680	+0.1203	+20	-44
β Capricorni	3	3.46	17.3	15 8.6	12 43.3	- 1 27.0	+0.4995	0.5665	0.1356	+59	- 8
B. A. C. 7087	6	3.39	17.7	14 7.1	18 38.1	+ 4 15.6	+0.2536	0.5656	0.1440	+44	-22
ν Aquarii	4½	3.22	18 7	11 50.3	23 10 35.9	- 4 19.5	+0.3421	0.5627	0.1638	+52	-17
17 Aquarii	6	3.15	18.6	9 48.8	16 40.8	+ 1 33.0	-0.7398	0.5615	0.1702	- 9	-90
19 Aquarii	5½	+3.13	+18.7	-10 14.5	17 42.2	+ 2 32.3	-0.1224	0.5614	+0.1712	+26	-43
ξ Aquarii	5	3.05	18.6	8 22.2	23 24.9	+ 8 3.3	-1.0617	0.5605	0.1769	-30	-90
B. A. C. 7562	6½	3.02	19.1	9 34.3	24 2 40.4	+11 12.2	+0.7581	0.5601	0.1797	+75	+ 6
c^1 Capricorni	5	3.02	19.1	9 36.8	2 42.4	+11 14.1	+0.8078	0.5601	0.1797	+81	+ 9
c^2 Capricorni	6	3.03	19.1	9 48.6	3 18.4	+11 48.9	+1.1174	0.5601	0.1798	+81	+32
30 Aquarii	5½	+2.93	+18.7	- 7 4.9	11 4.3	- 4 41.0	-0.2693	0.5593	+0.1861	+19	-52
B. A. C. 7744	6	2.87	18.3	5 17.7	15 24.9	- 0 29.2	-1.2894	0.5588	0.1892	-53	-90
44 Aquarii	5½	2.86	18.5	5 58.0	17 24.4	+ 1 26.3	-0.2225	0.5586	0.1905	+23	-49
51 Aquarii	5	2.82	18.3	5 25.3	20 37.0	+ 4 32.3	-0.1676	0.5582	0.1924	+26	-45
κ Aquarii	5	2.75	18.1	- 4 49.5	25 2 52.4	+10 35.2	+0.4336	0.5582	0.1954	+62	-12
κ Piscium	5½	+2.52	+15.8	+ 0 37.2	26 1 22.4	+ 8 19.6	-0.6519	0.5590	+0.2014	0	-82
9 Piscium	6	2.52	15.8	0 39.2	1 30.8	+ 8 27.7	-0.6587	0.5590	0.2023	+ 9	-67
15 Piscium	6½	2.46	15.6	0 40.3	5 16.2	-11 54.5	+0.0797	0.5595	0.2010	+40	-31
16 Piscium	6	2.47	15.3	1 27.5	5 41.3	-11 30.3	-0.6377	0.5598	0.2010	+ 1	-81
λ Piscium	5	2.43	15.4	1 8.5	8 15.6	- 9 1.2	+0.2017	0.5599	0.2007	+48	-25
19 Piscium	6	+2.42	+14.7	+ 2 50.5	10 13.7	- 7 7.2	-1.1319	0.5603	+0.2004	-32	-87
22 Piscium	6½	2.38	14.8	2 17.0	12 44.8	- 4 41.2	-0.0593	0.5607	0.2002	+32	-39
25 Piscium	6	2.37	15.0	1 26.6	13 15.0	- 4 12.0	+0.8956	0.5607	0.2000	+90	+15
51 Piscium	6	2.23	11.8	6 18.9	27 6 54.1	-11 9.3	-0.5620	0.5650	0.1940	+ 5	-72
60 Piscium	6½	2.14	11.2	6 6.4	13 33.4	- 4 43.9	+0.9272	0.5667	0.1903	+90	+19
62 Piscium	6	+2.14	+11.0	+ 6 39.9	13 56.7	- 4 21.5	+0.4366	0.5672	+0.1899	+63	-11
δ Piscium	4½	+2.14	+10.9	+ 6 57.0	14 7.3	- 4 11.2	+0.1821	0.5671	+0.1897	+46	-24

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
JUNE.											
ε Piscium	4	+2.08	+10.1	+ 7 15.8	**27** 20 24.4	+ 1 52.7	+1.0426	0.5696	+0.1849	+90	+27
π Piscium	5½	1.98	7.3	11 32.7	**28** 11 12.3	− 7 50.9	−0.6372	0.5748	0.1715	+ 1	−74
B. A. C. 609	6	1.88	6.1	11 43.7	20 43.9	+ 1 19.9	+0.7560	0.5789	0.1601	+90	+11
29 Arietis	6½	1.76	3.5	14 31.0	**29** 10 45.3	− 9 9.7	+0.0605	0.5849	0.1406	+39	−25
ο Arietis	6	1.72	2.8	14 48.8	15 34.7	− 4 31.1	+0.4215	0.5871	0.1328	+63	− 5
σ Arietis	5½	+1.68	+ 2.5	+14 35.9	18 26.6	− 1 45.7	+1.0127	0.5882	+0.1279	+90	+32
53 Arietis	6½	1.66	+ 1.0	17 25.6	**30** 0 56.4	+ 4 29.4	−1.0394	0.5905	0.1172	−28	−73
Neptune				16 10.3	6 2.2	+ 9 23.4	+0.7980	0.5912	0.1079	+90	+19
Mars				18 2.7	10 33.2	−10 15.9	−0.6193	0.5654	0.0917	+ 1	−65
B. A. C. 1240	6	+1.47	− 2.0	+17 51.8	22 28.8	+ 1 12.1	+0.6089	0.5967	+0.0750	+81	+11
JULY.											
ω^1 Tauri	6	+1.46	− 2.7	+19 17.9	**1** 1 47.8	+ 4 23.3	−0.6008	0.5977	+0.0688	+ 2	−60
Saturn				19 20.3	5 52.7	+ 8 18.7	−0.3774	0.5940	0.0595	+14	−43
ε Tauri	3½	+1.40	− 3.4	+18 55.1	9 33.4	+11 50.8	+0.2527	0.5988	+0.0521	+51	− 6
B. A. C. 1468	6	1.34	4.1	18 31.2	16 35.3	− 5 23.8	+0.9738	0.5997	0.0368	+90	+38
i Tauri	5½	1.32	4.4	18 38.3	18 36.8	− 3 27.1	+0.9237	0.5997	0.0328	+90	+35
m Tauri	5½	1.29	5.2	18 29.1	**2** 0 59.4	+ 2 40.6	+1.2445	0.5996	0.0186	+90	+66
l Tauri	5½	1.32	5.4	20 15.6	1 7.6	+ 2 48.5	−0.5531	0.5995	+0.0184	+ 4	−52
Mercury				+20 4.1	6 24.0	+ 7 52.4	−0.2887	0.5595	−0.0087	+19	−33
				NEW	*MOON.*						
60 Cancri	6	+1.16	−11.9	12 4.1	**6** 1 46.1	− 0 5.9	+0.4737	0.5547	0.1530	+67	− 5
α Cancri	4	1.16	11.8	12 18.4	2 57.2	+ 1 2.9	+0.0405	0.5541	0.1542	+38	−29
κ Cancri	5	+1.18	−12.0	+11 8.1	7 19.2	+ 5 16.3	+0.5988	0.5518	−0.1582	+78	+ 1
ω Leonis	5½	1.23	12.4	9 33.7	17 12.0	− 9 10.0	+0.6639	0.5457	0.1669	+85	+ 4
h Leonis	5½	1.24	12.4	10 13.7	18 52.9	− 7 32.4	−0.3287	0.5445	0.1683	+18	−52
B. A. C. 3407	6	1.33	12.5	8 52.0	**7** 7 41.6	+ 4 52.2	−1.0872	0.5374	0.1766	−29	−81
π Leonis	5	1.33	12.6	8 36.1	8 44.0	+ 5 52.7	−0.9874	0.5369	0.1771	−21	−82
14 Sextantis	6	+1.35	−13.2	+ 6 10.7	12 2.0	+ 9 4.6	+1.0285	0.5354	−0.1788	+90	+26
16 Sextantis	6	1.36	12.9	6 44.5	13 15.3	+10 15.7	+0.2044	0.5350	0.1793	+48	−23
34 Sextantis	6½	1.50	13.4	4 11.4	**8** 6 11.2	+ 2 40.9	−0.1301	0.5276	0.1849	+29	−43
36 Sextantis	6	1.52	13.6	3 6.0	7 29.3	+ 3 56.6	+0.8097	0.5268	0.1855	+90	+10
p^3 Leonis	6	1.63	13.3	2 35.2	18 45.8	− 9 6.9	−0.7298	0.5234	0.1868	− 4	−86
p^5 Leonis	5½	+1.66	−13.8	+ 0 33.8	22 19.8	− 5 39.1	+0.8087	0.5222	−0.1868	+90	+ 9
υ Leonis	5	1.78	13.5	− 0 10.9	**9** 10 29.1	+ 6 9.1	−0.6480	0.5196	0.1862	0	−82
f Virginis	6	2.15	13.1	5 11.5	**10** 18 9.1	−11 5.6	−0.9160	0.5180	0.1766	−17	−90
χ Virginis	5	2.18	13.8	7 21.2	19 21.6	− 9 55.2	+1.2581	0.5181	0.1760	+83	+46
28 Virginis	6	2.19	13.4	6 51.5	20 52.6	− 8 26.8	+0.4453	0.5180	0.1750	+62	−11
B. A. C. 4394	6	+2.37	−12.9	− 8 21.6	**11** 10 52.3	+ 5 8.6	−0.2928	0.5199	−0.1669	+17	−53
50 Virginis	6	2.40	13.2	9 42.6	11 29.9	+ 5 45.1	+1.0960	0.5200	0.1662	+81	+30
56 Virginis	6½	2.43	13.0	9 45.1	14 6.7	+ 8 17.4	+0.7093	0.5204	0.1649	+80	+ 4
58 Virginis	6	2.45	12.9	9 56.1	15 31.9	+ 9 40.1	+0.6781	0.5210	0.1635	+79	+ 2
62 Virginis	6½	2.47	13.0	10 41.6	17 2.0	+11 7.6	+1.2715	0.5211	0.1628	+80	+50
α Virginis	1	+2.51	−12.6	−10 33.2	19 33.7	−10 25.1	+0.7076	0.5217	−0.1607	+80	+ 4
k Virginis	5	2.54	11.9	9 33.9	23 36.8	− 6 29.1	−1.0301	0.5226	0.1575	−28	−90
86 Virginis	6	2.65	11.9	11 50.6	**12** 6 18.1	+ 0 0.4	+0.4533	0.5242	0.1524	+59	−11
B. A. C. 4700	6	2.84	11.0	13 45.2	18 59.4	−11 40.9	+0.7050	0.5283	0.1403	+76	+ 4
λ Virginis	4½	2.87	10.0	12 50.1	23 13.1	− 7 34.8	−0.8905	0.5299	0.1361	−21	−90
5 Libræ	6½	+3.10	− 8.6	−14 58.7	**13** 12 37.1	+ 5 24.5	−0.2497	0.5354	−0.1205	+14	−50
α^1 Libræ	6	3.13	8.5	15 30.7	14 56.9	+ 7 40.0	+0.0606	0.5364	0.1180	+31	−32
α^2 Libræ	2½	3.13	8.6	15 33.4	15 2.6	+ 7 45.5	+0.0972	0.5364	0.1180	+33	−30
ν^1 Libræ	6	3.23	7.4	15 48.2	22 45.6	− 8 45.9	−0.5018	0.5401	0.1080	− 1	−69
ν^2 Libræ	6½	3.23	7.4	16 1.9	22 51.0	− 8 40.6	−0.2601	0.5401	0.1079	+12	−52
26 Libræ	6	+3.32	− 7.1	−17 20.0	**14** 2 35.2	− 5 3.4	+0.7740	0.5414	−0.1028	+73	+ 9
28 Libræ	6½	+3.36	− 6.9	−17 44.1	5 38.5	− 2 5.9	+0.9065	0.5428	−0.0987	+73	+18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
ζ^1 Libræ	6½	+3.38	− 5.7	−16 18.6	14 9 12.6	+ 1 21.4	−1.0009	0.5445	−0.0942	−34	−90
ζ^2 Libræ	6	3.39	5.9	17 2.3	9 50.1	+ 1 57.7	−0.2611	0.5446	0.0929	+10	−63
ζ^3 Libræ	6	3.38	5.6	16 12.6	10 22.1	+ 2 28.6	−1.2179	0.5449	0.0926	−55	−90
ζ^4 Libræ	6	3.40	5.5	16 27.4	11 26.4	+ 3 30.8	−1.0438	0.5457	0.0902	−38	−90
47 Libræ	6½	3.57	4.4	19 2.3	21 51.5	−10 24.3	+0.9131	0.5501	0.0749	+71	+18
β^1 Scorpii	2	+3.64	− 3.4	−19 29.1	15 2 44.1	− 5 41.3	+1.0549	0.5525	−0.0672	+71	+30
β^2 Scorpii	5½	3.64	3.4	19 29.0	2 44.2	− 5 41.2	+1.0532	0.5525	0.0672	+71	+30
ν^2 Scorpii	4	3.67	2.6	19 9.3	5 47.3	− 2 44.1	+0.4969	0.5538	0.0622	+52	− 8
ν^1 Scorpii	6	3.67	2.6	19 8.8	5 47.4	− 2 44.0	+0.4878	0.5538	0.0624	+51	− 8
ψ Ophiuchi	5	3.73	− 1.7	19 45.7	11 23.2	+ 2 40.6	+0.8326	0.5560	0.0534	+71	+13
B. A. C. 5580	6½	+3.81	+ 0.1	−19 42.0	19 31.8	+10 32.8	+0.3878	0.5595	−0.0388	+42	−14
29 Ophiuchi	6	3.86	2.2	18 42.6	16 4 36.2	− 4 41.3	−0.9631	0.5632	−0.0228	−38	−90
B. A. C. 6060	6	4.01	7.5	18 46.7	17 4 38.9	− 5 28.7	−0.8935	0.5706	+0.0222	−34	−90
16 Sagittarii	6	4.10	9.2	20 25.1	13 5.4	+ 2 40.0	+1.1041	0.5719	0.0379	+70	+35
B. A. C. 6294	6	4.06	11.0	18 28.7	20 13.2	+ 9 32.7	−0.6330	0.5731	0.0513	−15	−84
Lalande 35497	6	+4.10	+13.5	−19 24.6	18 9 58.5	− 1 11.5	+1.2351	0.5744	+0.0771	+71	+51
ρ^1 Sagittarii	4	4.07	15.1	18 3.7	18 6.1	+ 6 38.7	+0.5045	0.5745	0.0918	+55	− 7
ρ^2 Sagittarii	5½	4.08	15.0	18 31.1	18 9.7	+ 6 42.2	+0.9895	0.5745	0.0918	+72	+24
e^1 Sagittarii	6	4.03	16.6	16 33.2	19 2 24.6	− 9 20.5	−0.2469	0.5744	0.1068	+12	−51
e^2 Sagittarii	5	4.02	16.8	16 23.4	3 12.0	− 8 34.7	−0.3320	0.5744	0.1075	+ 7	−56
B. A. C. 6746	6	+4.01	+16.9	−15 44.2	3 39.2	− 8 8.5	−0.9642	0.5744	+0.1086	−29	−90
g Sagittarii	5½	4.01	18.0	15 47.7	9 56.3	− 2 4.8	−0.1854	0.5740	0.1189	+16	−47
β Capricorni	3	3.95	19.4	15 8.6	20 1.3	+ 7 38.7	+0.4176	0.5731	0.1348	+53	−13
B. A. C. 7087	6	3.90	20.3	14 7.1	20 1 48.8	−10 46.1	+0.1636	0.5722	0.1432	+38	−27
8 Aquarii	6	3.83	21.6	13 29.8	13 8.7	+ 0 9.9	+1.2328	0.5706	0.1582	+77	+46
ν Aquarii	4½	+3.79	+21.8	−11 50.2	17 26.1	+ 4 18.2	+0.2157	0.5699	+0.1639	+44	−24
17 Aquarii	6	3.73	22.1	9 48.7	23 22.7	+10 2.4	−0.8696	0.5692	0.1700	−17	−90
19 Aquarii	5½	3.72	22.3	10 14.4	21 0 22.8	+11 0.4	−0.2578	0.5690	0.1711	+18	−51
ξ Aquarii	5	3.66	22.4	8 22.1	5 57.8	− 7 36.3	−1.2003	0.5680	0.1770	−43	−90
B. A. C. 7562	6½	3.64	22.8	9 34.2	9 8.8	− 4 31.9	+0.5980	0.5675	0.1799	+72	− 3
c^1 Capricorni	5	+3.64	+22.8	− 9 36.7	9 10.8	− 4 29.9	+0.6457	0.5675	+0.1801	+77	0
c^2 Capricorni	6	3.65	22.9	9 48.5	9 45.9	− 3 56.1	+0.9537	0.5674	0.1807	+80	+19
30 Aquarii	5½	3.57	22.8	7 4.8	17 21.5	+ 3 23.7	−0.4368	0.5667	0.1866	+10	−63
44 Aquarii	5½	3.52	22.9	5 57.9	23 33.3	+ 9 22.6	−0.4005	0.5656	0.1912	+13	−61
51 Aquarii	5	3.49	22.8	5 25.2	22 2 41.7	−11 35.5	−0.3511	0.5654	0.1932	+16	−57
κ Aquarii	5	+3.44	+22.8	− 4 49.4	8 49.2	− 5 40.7	+0.2354	0.5649	+0.1963	+49	−23
κ Piscium	5½	3.28	20.9	+ 0 37.2	23 6 55.0	− 8 20.4	−0.8710	0.5644	0.2017	−13	−90
9 Piscium	6	3.28	20.9	0 39.2	7 3.5	− 8 12.2	−0.7072	0.5644	0.2017	− 3	−90
15 Piscium	6½	3.23	20.8	0 40.3	10 45.4	− 4 38.0	−0.1485	0.5643	0.2016	+28	−44
16 Piscium	6	3.24	20.5	1 27.5	11 10.3	− 4 13.9	−0.8604	0.5643	0.2016	−13	−89
λ Piscium	5	+3.21	+20.5	+ 1 8.5	13 42.4	− 1 47.0	−0.0287	0.5645	+0.2016	+34	−37
22 Piscium	6½	3.17	19.9	2 17.1	18 8.3	+ 2 29.7	−0.2934	0.5648	0.2008	+20	−53
25 Piscium	6	3.16	20.1	1 26.7	18 38.0	+ 2 58.4	+0.6558	0.5648	0.2006	+83	0
51 Piscium	6	3.04	17.3	6 19.0	24 12 8.2	− 4 7.9	−0.8066	0.5666	0.1942	− 9	−84
60 Piscium	6½	2.96	16.5	6 6.5	18 45.9	+ 2 15.9	+0.6787	0.5680	0.1901	+86	+ 3
62 Piscium	6	+2.96	+16.4	+ 6 40.0	19 9.2	+ 2 38.4	+0.1870	0.5680	+0.1901	+47	−24
δ Piscium	4½	2.96	16.2	6 57.1	19 19.7	+ 2 48.5	−0.0674	0.5680	0.1901	+32	−38
ϵ Piscium	4	2.91	15.4	7 15.9	25 1 36.3	+ 8 51.9	+0.7932	0.5696	0.1849	+90	+10
π Piscium	5½	2.82	12.2	11 32.8	16 26.8	− 0 49.2	−0.8882	0.5736	0.1707	−15	−79
54 Ceti	6	2.73	11.7	10 28.0	22 23.4	+ 4 54.6	+1.2020	0.5751	0.1641	+90	+45
B. A. C. 609	6	+2.72	+10.7	+11 43.8	26 2 2.9	+ 8 26.3	+0.5160	0.5759	+0.1599	+70	− 3
29 Arietis	6½	2.59	7.6	14 31.0	16 14.6	− 1 53.0	−0.1723	0.5804	0.1405	+26	−39
o Arietis	6	2.55	6.9	14 48.9	21 8.5	+ 2 50.0	+0.1943	0.5816	0.1329	+47	−17
σ Arietis	5½	2.51	6.5	14 36.0	27 0 3.1	+ 5 38.2	+0.7911	0.5826	0.1281	+90	+17
53 Arietis	6½	2.49	4.4	17 25.7	6 39.8	−11 59.9	−1.2691	0.5845	0.1169	−56	−73
NEPTUNE				+16 18.2	12 50.0	− 6 3.5	+0.5623	0.5855	+0.1058	+75	+ 6
B. A. C. 1240	6	+2.25	+ 1.1	+17 51.8	28 4 39.6	+ 9 10.4	+0.4245	0.5807	+0.0761	+64	+ 1

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					LIMITING PARALLELS.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
ω^1 Tauri	6	+2.24	0.0	+19 17.9	28 8 3.3	-11 33.6	-0.7918	0.5899	+0.0697	-10	-71
ε Tauri	3½	2.14	- 1.2	18 55.2	16 0.2	- 3 54.8	+0.0817	0.5911	0.0535	+41	-15
SATURN				19 46.9	17 1.3	- 2 56.2	-0.7314	0.5777	0.0632	- 7	-70
B. A. C. 1468	6	2.05	2.2	18 31.3	23 12.6	+ 3 1.1	+0.8200	0.5915	0.0387	+90	+27
i Tauri	5½	2.03	2.7	18 38.4	29 1 17.1	+ 5 0.8	+0.7654	0.5918	0.0345	+90	+25
m Tauri	5½	+1.97	- 3.5	+18 29.1	7 48.9	+11 17.6	+1.1105	0.5916	+0.0207	+90	+51
l Tauri	5½	2.00	4.1	20 15.6	7 57.3	+11 25.7	-0.7055	0.5916	+0.0198	- 5	-68
119 Tauri	5	1.87	4.7	18 30.4	17 57.5	- 2 56.9	+1.1888	0.5909	-0.0014	+90	+60
120 Tauri	6	1.86	4.8	18 27.3	18 29.8	- 2 25.8	+1.2405	0.5907	0.0027	+90	+67
127 Tauri	6½	1.83	5.3	18 55.3	22 19.9	+ 1 15.5	+0.7357	0.5901	0.0101	+90	+25
χ^1 Orionis	4½	+1.80	- 6.4	+20 15.1	30 3 1.9	+ 5 46.8	-0.7058	0.5893	-0.0203	- 5	-68
χ^2 Orionis	5	1.79	6.2	19 43.4	3 16.0	+ 6 0.4	-0.1665	0.5893	0.0204	+26	-26
χ^3 Orionis	6	1.74	6.5	19 41.3	6 46.5	+ 9 23.0	-0.2167	0.5885	0.0282	+23	-30
χ^4 Orionis	5	1.75	6.7	20 8.3	6 57.5	+ 9 33.6	-0.6860	0.5884	0.0285	- 4	-66
68 Orionis	6	1.70	7.0	19 48.8	10 19.2	-11 12.3	-0.4596	0.5878	0.0349	+10	-47
71 Orionis	6	+1.70	- 7.0	+19 11.5	11 30.5	-10 3.7	+0.1394	0.5874	-0.0381	+44	-11
ν Geminorum	4½	1.65	8.0	20 17.0	17 21.4	- 4 25.8	-1.2454	0.5858	0.0492	-55	-70
20 Geminorum	6½	1.61	7.5	17 51.5	18 47.7	- 3 2.7	+1.1923	0.5852	0.0523	+90	+56
26 Geminorum	5½	1.58	7.9	17 45.4	23 2.6	+ 1 2.8	+1.0593	0.5837	0.0605	+90	+42
λ Geminorum	4	1.47	9.0	16 44.9	31 14 14.9	- 8 18.2	+0.9727	0.5776	0.0883	+90	+33
68 Geminorum	5½	+1.42	- 9.5	+16 4.5	20 58.4	- 1 49.2	+1.0447	0.5745	-0.1000	+90	+37

AUGUST.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
				NEW	*MOON.*						
o Leonis	3½	+1.29	-11.8	+10 25.2	3 7 43.3	+ 6 57.4	-1.1752	0.5438	-0.1699	-38	-80
B. A. C. 3407	6	1.31	11.9	8 52.0	16 2.4	- 8 59.1	-0.9482	0.5394	0.1752	-19	-81
π Leonis	5	1.31	11.9	8 36.1	17 4.6	- 7 59.0	-0.8466	0.5394	0.1758	-12	-82
14 Sextantis	6	1.32	11.7	6 10.7	20 21.6	- 4 48.0	+1.1776	0.5383	0.1774	+90	+39
16 Sextantis	6	1.32	11.8	6 44.5	21 34.3	- 3 37.5	+0.3569	0.5374	0.1781	+57	-15
34 Sextantis	6½	+1.39	-12.0	+ 4 11.4	4 14 24.0	-11 18.5	+0.0560	0.5307	-0.1845	+39	-32
36 Sextantis	6	1.40	12.0	3 6.0	15 41.8	-10 3.1	+0.9988	0.5302	0.1847	+90	+23
p^3 Leonis	6	1.46	12.0	2 35.2	5 2 52.9	+ 0 48.0	-0.5205	0.5268	0.1864	+ 7	-69
p^5 Leonis	5½	1 48	12.0	+ 0 33.8	6 25.2	+ 4 14.1	+1.0224	0.5258	0.1866	+90	+24
υ Leonis	5	1.58	11.8	- 0 10.9	18 28.7	- 8 3.6	-0.4100	0.5230	0.1859	+13	-61
f Virginis	6	+1.85	-11.4	- 5 11.5	7 1 55.7	- 1 31.2	-0.6412	0.5204	-0.1764	- 1	-81
28 Virginis	6	1.89	11.5	6 51.5	4 38.4	+ 1 6.8	+0.7204	0.5206	0.1750	+83	+ 4
B. A. C. 4394	6	2.06	10.9	8 21.6	18 35.3	- 9 20.6	-0.0074	0.5214	0.1667	+33	-36
56 Virginis	6½	2.11	10.9	9 45.1	21 49.3	- 6 12.2	+0.9968	0.5217	0.1645	+81	+22
58 Virginis	6	2.13	10.8	9 56.1	23 14.6	- 4 49.4	+0.9659	0.5219	0.1639	+80	+20
α Virginis	1	+2.17	-10.6	-10 33.2	8 3 16.2	- 0 54.9	+0.9972	0.5223	-0.1608	+80	+23
h Virginis	5	2.20	10.0	9 33.9	7 19.3	+ 3 1.1	-0.7394	0.5231	0 1577	- 9	-90
86 Virginis	6	2.32	9.9	11 50.6	14 0.9	+ 9 30.9	+0.7450	0.5243	0.1520	+76	+ 6
B. A. C. 4700	6	2.49	9.1	13 45.1	9 2 44.7	- 2 7.9	+0.9975	0.5274	0.1400	+77	+23
λ Virginis	4½	2.52	8.4	12 50.0	6 59.8	+ 1 59.6	-0.6046	0.5285	0.1357	- 3	-79
5 Libræ	6½	+2.74	- 7.2	-14 58.7	20 29.3	- 8 55.5	+0.0350	0.5332	-0.1203	+30	-34
α^1 Libræ	6	2.77	7.2	15 30.7	22 50.4	- 6 38.7	+0.3459	0.5337	0.1178	+48	-16
α^2 Libræ	2½	2.77	7.2	15 33.4	22 56.1	- 6 33.2	+0.3827	0.5341	0.1178	+50	-14
ν^1 Libræ	6	2.88	6.1	15 48.2	10 6 43.5	+ 0 59.7	-0.2242	0.5366	0.1079	+14	-49
ν^2 Libræ	6½	2.89	6.1	16 1.9	6 48.9	+ 1 5.1	+0.0184	0.5366	0.1079	+27	-35
26 Libræ	6	+2.96	- 6.0	-17 20.0	10 35.5	+ 4 44.6	+1.0539	0.5382	-0.1028	+73	+29
28 Libræ	6½	3.00	5.7	17 44.1	13 40.8	+ 7 44.1	+1.1855	0.5395	0.0985	+73	+43
ζ^1 Libræ	6½	3.03	4.5	16 18.6	17 17.3	+11 13.8	-0.7313	0.5407	0.0940	-16	-90
ζ^2 Libræ	6	3.04	4.7	17 2.3	17 55.3	+11 50.6	+0.0110	0.5409	0.0929	+25	-35
ζ^3 Libræ	6	3.04	4.3	16 12.6	18 27.5	-11 38.2	-0.9493	0.5415	0.0918	-30	-90
ζ^4 Libræ	6	+3.06	- 4.3	-16 27.4	19 32.7	-10 35.1	-0.7766	0.5419	-0.0905	-19	-90
47 Libræ	6½	+3.24	- 3.3	-19 2.2	11 6 5.7	- 0 22.3	+1.1757	0.5458	-0.0754	+71	+42

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ν^2 Scorpii	4	+3.35	- 1.8	-19 9.3	11 14 8.0	+ 7 24.5	+0.7485	0.5490	-0.0630	+71	+ 8
ν^1 Scorpii	6	3.35	1.8	19 8.8	14 8.1	+ 7 24.6	+0.7394	0.5490	0.0630	+71	+ 7
ψ Ophiuchi	5	3.43	0.9	19 45.7	19 48.3	-11 6.4	+1.0792	0.5514	0.0536	+70	+32
χ Ophiuchi	6	3.41	- 0.1	18 11.4	21 12.2	- 9 45.3	-0.7082	0.5521	0.0518	-19	-90
B. A. C. 5580	6½	3.52	+ 0.9	19 42.0	12 4 3.9	- 3 7.3	+0.6229	0.5545	0.0402	+61	0
29 Ophiuchi	6	+3.60	+ 2.9	-18 42.6	13 15.7	+ 5 46.0	-0.7449	0.5584	-0.0245	-24	-90
B. A. C. 6060	6	3.86	7.6	18 46.7	13 13 36.2	+ 5 16.6	-0.7159	0.5662	+0.0203	-23	-90
B. A. C. 6294	6	3.98	11.2	18 28.7	14 5 18.7	- 3 33.9	-0.4856	0.5702	0.0489	- 7	-69
ρ^1 Sagittarii	4	4.08	15.3	18 3.7	15 3 17.1	- 6 22.3	+0.6084	0.5737	0.0893	+63	- 1
ρ^2 Sagittarii	5½	4.09	15.1	18 31.1	3 20.7	- 6 18.8	+1.0912	0.5737	0.0893	+72	+33
e^1 Sagittarii	6	+4.08	+17.2	-16 33.2	11 35.4	+ 1 38.2	-0.1613	0.5745	+0.1045	+16	-45
e^2 Sagittarii	5	4.08	17.4	16 23.4	12 22.6	+ 2 23.8	-0.2497	0.5745	0.1051	+12	-51
B. A. C. 6746	6	4.06	17.7	15 44.2	12 49.9	+ 2 50.2	-0.8808	0.5745	0.1064	-25	-90
g Sagittarii	5½	4.08	18.7	15 47.7	19 5.5	+ 8 52.3	-0.1192	0.5748	0.1168	+20	-43
β Capricorni	3	4.08	20.3	15 8.6	16 5 6.7	- 5 27.9	+0.4586	0.5749	0.1326	+56	-10
B. A. C. 7087	6	+4.07	+21.4	-14 7.0	10 51.1	+ 0 4.2	+0.1884	0.5751	+0.1415	+40	-25
ν Aquarii	4½	4.04	23.5	11 50.2	17 2 16.4	- 9 3.6	+0.2038	0.5745	0.1623	+43	-24
17 Aquarii	6	4.00	24.2	9 48.7	8 7.1	- 3 25.3	-0.8878	0.5744	0.1692	-18	-90
19 Aquarii	5½	4.01	24.2	10 14.4	9 6.1	- 2 28.5	-0.2845	0.5742	0.1704	+16	-53
ξ Aquarii	5	3.98	24.8	8 22.1	14 34.9	+ 2 48.6	-1.2300	0.5740	0.1766	-47	-90
B. A. C. 7562	6½	+3.99	+24.8	- 9 34.2	17 42.2	+ 5 49.3	+0.5417	0.5740	+0.1797	+68	- 6
c^1 Capricorni	5	3.99	24.8	9 36.7	17 44.1	+ 5 51.2	+0.5906	0.5740	0.1797	+72	- 3
c^2 Capricorni	6	3.99	24.8	9 48.5	18 18.5	+ 6 24.3	+0.8909	0.5740	0.1799	+80	+15
30 Aquarii	5½	3.96	25.5	7 4.8	18 1 44.3	-10 25.7	-0.5030	0.5736	0.1867	+ 6	-68
44 Aquarii	5½	3.93	25.8	5 57.9	7 47.5	- 4 35.4	-0.4818	0.5733	0.1914	+ 8	-67
51 Aquarii	5	+3.91	+25.8	- 5 25.2	10 51.4	- 1 38.0	-0.4411	0.5733	+0.1934	+10	-63
κ Aquarii	5	3.89	25.8	- 4 49.4	16 49.7	+ 4 7.6	+0.1255	0.5729	0.1967	+42	-28
κ Piscium	5½	3.81	25.0	+ 0 37.3	19 14 19.5	+ 0 51.7	-1.0167	0.5732	0.2028	-24	-90
9 Piscium	6	3.81	25.0	0 39.3	14 27.6	+ 0 59.5	-0.8551	0.5735	0.2028	-12	-90
15 Piscium	6½	3.78	24.7	0 40.4	18 3.4	+ 4 27.6	-0.3116	0.5735	0.2029	+18	-54
16 Piscium	6	+3.79	+24.7	+ 1 27.6	18 27.4	+ 4 50.8	-1.0146	0.5737	+0.2029	-23	-89
λ Piscium	5	3.77	24.5	1 8.6	20 55.3	+ 7 13.5	-0.1982	0.5737	0.2027	+25	-47
21 Piscium	6	3.74	24.2	0 25.9	20 0 8.3	+10 19.6	+1.1636	0.5738	0.2024	+90	+36
22 Piscium	6½	3.75	24.1	2 17.2	1 13.7	+11 22.6	-0.4695	0.5741	0.2021	+10	-65
25 Piscium	6	3.74	24.0	1 26.8	1 42.5	+11 50.4	+0.4661	0.5741	0.2021	+65	-10
51 Piscium	6	+3.70	+21.8	+ 6 19.1	18 43.6	+ 4 15.0	-1.0051	0.5758	+0.1955	-23	-84
60 Piscium	6½	3.66	21.1	6 6.6	21 1 10.9	+10 28.4	+0.4543	0.5767	0.1915	+64	- 9
62 Piscium	6	3.67	21.0	6 40.1	1 33.5	+10 50.2	-0.0316	0.5767	0.1912	+34	-36
δ Piscium	4½	3.66	20.9	6 57.1	1 43.7	+11 0.0	-0.2813	0.5769	0.1911	+20	-51
ε Piscium	4	3.62	20.0	7 15.9	7 50.9	- 7 6.0	+0.5595	0.5777	0.1863	+73	- 3
π Piscium	5½	+3.58	+16.7	+11 32.9	22 21.3	+ 6 52.7	-1.1179	0.5803	+0.1724	-33	-79
54 Ceti	6	3.49	16.1	10 28.1	22 4 10.7	-11 30.7	+0.9455	0.5813	0.1654	+90	+23
B. A. C. 609	6	3.49	15.1	11 43.9	7 46.0	- 8 3.3	+0.2641	0.5820	0.1607	+51	-16
29 Arietis	6½	3.41	11.9	14 31.1	21 44.4	+ 5 24.1	-0.4227	0.5845	0.1408	+12	-54
ο Arietis	6	3.37	11.1	14 49.0	23 2 34.7	+10 3.6	-0.0604	0.5855	0.1331	+32	-31
σ Arietis	5½	+3.33	+10.5	+14 36.1	5 27.5	-11 10.1	+0.5327	0.5860	+0.1283	+72	+ 2
NEPTUNE				16 19.9	18 29.7	+ 1 22.7	+0.3172	0.5880	0.1056	+55	- 8
B. A. C. 1119	6	3.15	5.9	16 9.4	24 1 12.3	+ 7 50.1	+1.1668	0.5884	0.0938	+90	+50
B. A. C. 1240	6	3.08	3.7	17 51.9	9 56.2	- 7 45.7	+0.1748	0.5893	0.0768	+46	-13
B. A. C. 1272	6	3.03	3.5	17 1.7	12 54.0	- 4 54.6	+1.2480	0.5895	0.0708	+90	+62
ω^1 Tauri	6	+3.07	+ 2.7	+19 17.9	13 20.1	- 4 29.6	-1.0342	0.5893	+0.0706	-28	-71
δ^3 Tauri	5	2.96	1.8	17 39.5	20 3.2	+ 1 58.2	+1.0619	0.5892	0.0567	+90	+43
ε Tauri	3½	2.97	+ 1.2	18 55.2	21 18.5	+ 3 10.7	-0.1567	0.5892	0.0543	+26	-29
SATURN				20 1.2	25 1 36.2	+ 7 18.6	-1.0713	0.5871	0.0447	-32	-70
B. A. C. 1468	6	2.87	- 0.1	18 31.3	4 33.5	+10 9.3	+0.5874	0.5891	0.0384	+78	+13
i Tauri	5½	+2.84	- 0.7	+18 38.4	6 38.8	-11 50.2	+0.5451	0.5888	+0.0345	+74	+11
m Tauri	5½	+2.74	- 1.7	+18 29.2	13 14.3	- 5 29.6	+0.8876	0.5884	+0.0216	+90	+33

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
l Tauri	5½	+2.78	− 2.1	+20 15.7	25 13 22.8	− 5 21.4	−0.9354	0.5882	+0.0214	−21	−70
119 Tauri	5	2.61	3.6	18 30.2	23 29.6	+ 4 22.6	+0.9819	0.5865	+0.0009	+90	+42
120 Tauri	6	2.60	3.8	18 27.3	26 0 2.4	+ 4 54.2	+1.0320	0.5865	−0.0010	+90	+46
127 Tauri	6½	2.56	4.3	18 55.3	3 55.4	+ 8 38.4	+0.5304	0.5858	0.0095	+73	+13
χ^1 Orionis	4½	2.53	5.5	20 15.1	8 41.2	−10 46.4	−0.9126	0.5843	0.0193	−19	−70
χ^2 Orionis	5	+2.52	− 5.4	+19 43.4	8 55.8	−10 32.4	−0.3710	0.5843	−0.0193	+14	−40
χ^3 Orionis	6	2.47	5.8	19 41.3	12 29.3	− 7 6.8	−0.4147	0.5830	0.0268	+12	−43
χ^4 Orionis	5	2.48	5.9	20 8.3	12 40.4	− 6 56.1	−0.8864	0.5829	0.0270	−17	−70
68 Orionis	6	2.43	6.4	19 48.8	16 5.2	− 3 38.8	−0.6539	0.5824	0.0334	− 2	−63
71 Orionis	6	2.40	6.5	19 11.5	17 17.8	− 2 28.9	−0.0502	0.5820	0.0357	+33	−21
20 Geminorum	6½	+2.27	− 7.3	+17 51.5	27 0 42.0	+ 4 39.0	+1.0191	0.5794	−0.0503	+90	+40
26 Geminorum	5½	2.23	7.8	17 45.4	5 1.2	+ 8 48.8	+0.8921	0.5778	0.0583	+90	+30
λ Geminorum	4	2.05	9.4	16 44.9	20 29.4	− 0 16.3	+0.8329	0.5718	0.0863	+90	+23
68 Geminorum	5½	1.96	9.9	16 4.5	28 3 20.3	+ 6 20.2	+0.9173	0.5689	0.0968	+90	+28
1 Cancri	6	1.88	10.5	16 5.9	13 47.3	− 7 34.5	−0.2061	0.5640	0.1132	+24	−38
5 Cancri	6½	+1.87	−10.8	+16 46.5	15 48.8	− 5 37.2	−1.1543	0.5628	−0.1161	−38	−73
29 Cancri	6	1.73	11.2	14 35.6	29 4 16.0	+ 6 24.8	−0.3966	0.5573	0.1320	+13	−52
A^1 Cancri	6	1.67	11.4	13 5.8	11 4.9	−10 59.8	+0.2626	0.5543	0.1375	+51	−15
A^2 Cancri	6	1.65	11.4	12 32.1	12 50.5	− 9 17.6	+0.6109	0.5531	0.1430	+79	+ 4
60 Cancri	6	1.61	11.5	12 4.1	17 5.4	− 5 11.2	+0.4926	0.5513	0.1472	+68	− 3
α Cancri	4	+1.62	−11.5	+12 18.4	18 17.7	− 4 1.2	+0.0605	0.5508	−0.1484	+39	−27
κ Cancri	5	1.60	11.6	11 8.1	22 43.5	+ 0 16.1	+0.6434	0.5483	0.1532	+83	+ 4
ω Leonis	5½	1.55	11.8	9 33.7	30 8 43.4	+ 9 56.9	+0.7549	0.5441	0.1619	+90	+10
h Leonis	5½	1.54	11.9	10 13.7	10 25.2	+11 35.5	−0.2380	0.5434	0.1636	+22	−46
ο Leonis	3½	+1.52	−11.7	+10 25.2	14 55.5	− 8 2.7	−1.1885	0.5417	−0.1669	−40	−80
SEPTEMBER.											
				NEW	*MOON.*						
MERCURY				− 4 2.3	3 4 44.5	− 3 13.0	−0.9324	0.4747	−0.1493	−24	−90
f Virginis	6	+1.66	− 9.8	− 5 11.5	9 16.4	+ 7 37.1	−0.4600	0.5226	−0.1757	+10	−65
28 Virginis	6	1.69	10.0	6 51.5	11 58.6	+10 14.6	+0.9055	0.5228	0.1743	+83	+16
B. A. C. 4394	6	1.80	9.3	8 21.6	4 1 53.3	− 0 14.9	+0.1992	0.5232	0.1660	+45	−24
56 Virginis	6½	1.84	9.4	9 45.1	5 6.9	+ 2 53.1	+1.2084	0.5236	0.1640	+81	+42
58 Virginis	6	1.84	9.3	9 56.1	6 31.9	+ 4 15.5	+1.1792	0.5237	0.1627	+80	+39
α Virginis	1	+1.88	− 9.0	−10 33.1	10 33.2	+ 8 9.8	+1.2128	0.5242	−0.1597	+80	+42
k Virginis	5	1.91	8.3	9 33.8	14 35.9	−11 54.6	−0.5226	0.5248	0.1566	+ 4	−70
86 Virginis	6	1.99	8.2	11 50.5	21 17.4	− 5 24.9	+0.9741	0.5261	0.1510	+78	+22
λ Virginis	4½	2.15	6.6	12 50.0	5 14 17.8	+11 5.2	−0.3642	0.5292	0.1352	+10	−58
5 Libræ	6½	2.34	5.7	14 58.7	6 3 50.7	+ 0 13.6	+0.2865	0.5327	0.1200	+44	−19
α^1 Libræ	6	+2.36	− 5.6	−15 30.7	6 12.6	+ 2 31.2	+0.5985	0.5332	−0.1173	+66	− 2
α^2 Libræ	2½	2.36	5.6	15 33.4	6 18.4	+ 2 36.9	+0.6374	0.5332	0.1173	+70	0
ν^1 Libræ	6	2.46	4.7	15 48.2	14 9.1	+10 13.2	+0.0295	0.5354	0.1074	+28	−34
ν^2 Libræ	6½	2.47	4.8	16 1.9	14 14.6	+10 18.5	+0.2732	0.5354	0.1074	+42	−20
ζ^1 Libræ	6½	2.58	3.2	16 18.6	7 0 48.6	− 3 27.2	−0.4772	0.5387	0.0932	− 1	−67
ζ^2 Libræ	6	+2.61	− 3.4	−17 2.3	1 27.0	− 2 50.0	+0.2690	0.5388	−0.0919	+40	−20
ζ^3 Libræ	6	2.59	3.1	16 12.6	1 59.7	− 2 18.3	−0.6980	0.5388	0.0917	−14	−90
ζ^4 Libræ	6	2.61	2.9	16 27.3	3 5.6	− 1 14.6	−0.5266	0.5391	0.0889	− 4	−72
ν^2 Scorpii	4	2.89	0.7	19 9.3	21 55.4	− 7 0.5	+1.0102	0.5454	0.0625	+71	+26
ν^1 Scorpii	6	2.89	− 0.7	19 8.8	21 55.5	− 7 0.4	+1.0009	0.5454	0.0625	+71	+27
χ Ophiuchi	6	+2.95	+ 0.7	−18 11.4	8 5 6.6	− 0 3.2	−0.4590	0.5475	−0.0514	− 5	−66
B. A. C. 5580	6½	3.06	1.3	19 42.0	12 5.5	+ 6 42.0	+0.8776	0.5496	0.0401	+71	+16
29 Ophiuchi	6	3.15	3.2	18 42.5	21 27.6	− 8 14.3	−0.5072	0.5527	−0.0238	−10	−70
B. A. C. 6060	6	3.44	7.7	18 46.7	9 22 19.0	− 8 12.8	−0.4941	0.5597	+0.0185	−10	−69
B. A. C. 6294	6	3.59	11.1	18 28.7	10 14 22.7	+ 7 18.0	−0.2796	0.5633	0.0472	+ 4	−53
ρ^1 Sagittarii	4	+3.77	+15.1	−18 3.7	11 12 48.5	+ 4 57.1	+0.7920	0.5672	+0.0873	+72	+10
υ Sagittarii	4½	+3.73	+15.5	−16 10.1	12 52.3	+ 5 0.9	−1.1973	0.5672	+0.0873	−53	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
e^1 Sagittarii	6	+3.82	+17.0	-16 33.2	11 21 16.4	-10 52.7	+0.0052	0.5684	+0.1009	+25	-35
e^2 Sagittarii	5	3.82	17.1	16 23.4	22 4.3	-10 6.4	-0.0838	0.5686	0.1028	+21	-40
B. A. C. 6746	6	3.80	17.4	15 44.2	22 32.0	- 9 39.7	-0.7206	0.5689	0.1040	-15	-90
g Sagittarii	5½	3.85	18.5	15 47.7	12 4 54.1	- 3 31.1	+0.0365	0.5697	0.1141	+28	-33
β Capricorni	3	3.89	20.3	15 8.6	15 4.1	+ 6 17.5	+0.5988	0.5705	0.1298	+67	- 2
B. A. C. 7087	6	+3.91	+21.3	-14 7.0	20 52.7	+11 53.9	+0.3163	0.5711	+0.1387	+47	-18
ν Aquarii	4½	3.95	23.6	11 50.2	13 12 25.9	+ 2 54.0	+0.2995	0.5725	0.1601	+49	-19
17 Aquarii	6	3.96	24.4	9 48.7	18 18.3	+ 8 33.9	-0.8027	0.5731	0.1667	-13	-90
19 Aquarii	5½	3.97	24.6	10 14.4	19 17.5	+ 9 31.0	-0.2016	0.5731	0.1678	+21	-47
ξ Aquarii	5	3.96	25.4	8 22.1	14 0 46.8	- 9 11.3	-1.1601	0.5736	0.1741	-39	-90
B. A. C. 7562	6½	+3.98	+25.7	- 9 34.2	3 54.1	- 6 10.7	+0.6050	0.5737	+0.1773	+73	- 2
c^1 Capricorni	5	3.98	25.7	9 36.7	3 56.0	- 6 8.8	+0.6524	0.5737	0.1773	+77	+ 1
c^2 Capricorni	6	3.99	25.7	9 48.5	4 30.3	- 5 35.7	+0.9539	0.5740	0.1781	+80	+20
30 Aquarii	5½	4.00	26.4	7 4.8	11 55.0	+ 1 33.1	-0.4547	0.5742	0.1847	+ 9	-64
44 Aquarii	5½	4.00	26.9	5 57.9	17 56.3	+ 7 21.5	-0.4466	0.5751	0.1897	+10	-64
51 Aquarii	5	+4.01	+27.1	- 5 25.2	20 58.8	+10 17.5	-0.4124	0.5753	+0.1919	+12	-61
κ Aquarii	5	4.01	27.3	- 4 49.3	15 2 53.7	- 8 0.4	+0.1365	0.5754	0.1953	+43	-28
κ Piscium	5½	4.06	27.3	+ 0 37.4	16 0 4.2	-11 35.5	-1.0440	0.5793	0.2027	-26	-90
9 Piscium	6	4.06	27.3	0 29.4	0 12.2	-11 27.8	-0.8837	0.5795	0.2027	-15	-90
15 Piscium	6½	4.06	27.2	0 40.5	3 43.5	- 8 4.2	-0.3515	0.5803	0.2030	+16	-57
16 Piscium	6	+4.07	+27.0	+ 1 27.7	4 7.2	- 7 41.4	-1.0493	0.5803	+0.2030	-26	-89
λ Piscium	5	4.07	26.8	1 8.6	6 31.9	- 5 21.9	-0.2457	0.5805	0.2030	+22	-50
21 Piscium	6	4.06	26.8	0 25.9	9 40.6	- 2 20.1	+1.0957	0.5813	0.2027	+90	+30
22 Piscium	6½	4.08	26.5	2 17.2	10 44.5	- 1 18.5	-0.5220	0.5813	0.2026	+ 7	-69
25 Piscium	6	4.08	26.6	1 26.8	11 12.8	- 0 51.3	+0.4034	0.5815	0.2026	+61	-13
51 Piscium	6	+4.08	+25.0	+ 6 19.1	17 3 47.6	- 8 53.0	-1.0824	0.5849	+0.1966	-29	-84
60 Piscium	6½	4.07	24.0	6 6.6	10 3.8	- 2 50.8	+0.3415	0.5860	0.1930	+56	-15
62 Piscium	6	4.08	23.9	6 40.1	10 25.7	- 2 29.7	-0.1362	0.5862	0.1924	+28	-42
δ Piscium	4½	4.09	23.8	6 57.2	10 35.6	- 2 20.2	-0.3842	0.5864	0.1923	+13	-59
ε Piscium	4	4.08	23.2	7 16.0	16 31.8	+ 3 22.8	+0.4351	0.5880	0.1877	+63	-10
π Piscium	5½	+4.11	+20.3	+11 32.9	18 6 34.8	- 7 6.0	-1.2394	0.5909	+0.1670	-47	-79
54 Ceti	6	4.07	19.4	10 28.1	12 13.1	- 1 40.4	+0.7847	0.5919	0.1669	+90	+13
B. A. C. 609	6	4.08	18.5	11 43.9	15 41.3	+ 1 39.8	+0.1086	0.5928	0.1622	+42	-25
29 Arietis	6½	4.06	15.1	14 31.2	19 5 12.8	- 9 19.9	-0.5880	0.5952	0.1426	+ 3	-67
ο Arietis	6	4.04	14.2	14 49.0	9 53.9	- 4 49.6	-0.2332	0.5960	0.1347	+22	-41
σ Arietis	5½	+4.03	+13.6	+14 36.1	12 41.3	- 2 8.7	+0.3510	0.5962	+0.1296	+57	- 8
NEPTUNE				16 15.5	20 1 1.6	+ 9 42.9	+0.1681	0.5977	0.1080	+45	-16
B. A. C. 1119	6	3.90	8.8	16 9.4	7 51.2	- 7 43.3	+0.9590	0.5974	0.0944	+90	+32
B. A. C. 1240	6	3.86	6.2	17 51.9	16 21.5	+ 0 27.0	-0.0218	0.5974	0.0779	+34	-24
B. A. C. 1272	6	3.81	5.7	17 1.7	19 14.9	+ 3 13.7	+1.0344	0.5971	0.0718	+90	+40
ω^1 Tauri	6	+3.87	+ 4.9	+19 18.0	19 40.3	+ 3 38.2	-1.2193	0.5971	+0.0703	-49	-71
δ^1 Tauri	4	3.76	4.3	17 16.2	21 1 13.1	+ 8 58.0	+1.1839	0.5966	0.0594	+90	+55
δ^3 Tauri	5	3.75	3.8	17 39.6	2 14.1	+ 9 56.6	+0.8496	0.5965	0.0574	+90	+28
ε Tauri	3½	3.78	3.2	18 55.3	3 27.7	+11 7.4	-0.3552	0.5964	0.0541	+15	-41
SATURN				20 3.4	8 50.7	- 7 42.1	-1.2442	0.5954	0.0431	-55	-70
B. A. C. 1468	6	+3.68	+ 1.6	+18 31.3	10 33.8	- 6 3.0	+0.3818	0.5950	+0.0491	+60	+ 1
i Tauri	5½	3.66	+ 1.0	18 38.4	12 36.8	- 4 4.8	+0.3383	0.5947	0.0348	+57	0
m Tauri	5½	3.58	- 0.4	18 29.2	19 5.3	+ 2 8.8	+0.6787	0.5932	0.0216	+90	+20
l Tauri	5½	3.61	1.0	20 15.7	19 13.6	+ 2 16.8	-1.1254	0.5932	0.0214	-38	-70
119 Tauri	5	3.45	2.6	18 30.3	22 5 11.7	+11 52.0	+0.7727	0.5902	+0.0009	+90	+28
120 Tauri	6	+3.44	- 2.6	+18 27.4	5 43.9	-11 37.0	+0.8208	0.5901	-0.0012	+90	+31
127 Tauri	6½	3.39	3.6	18 55.3	9 34.1	- 7 55.6	+0.3288	0.5885	0.0091	+56	+ 2
χ^1 Orionis	4½	3.36	5.1	20 15.1	14 17.2	- 3 23.1	-1.1041	0.5871	0.0182	-36	-70
χ^2 Orionis	5	3.34	5.0	19 43.4	14 31.2	- 3 9.7	-0.5659	0.5868	0.0192	+ 3	-54
χ^3 Orionis	6	3.28	5.7	19 41.3	18 3.1	+ 0 14.3	-0.6099	0.5857	0.0259	0	-58
χ^4 Orionis	5	+3.29	- 5.9	+20 8.3	18 14.1	+ 0 24.9	-1.0792	0.5857	-0.0261	-33	-70
68 Orionis	6	+3.24	- 6.4	+19 48.8	21 37.2	+ 3 40.5	-0.8451	0.5839	-0.0334	-14	-70

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
71 Orionis	6	+3.21	− 6.4	+19 11.5	22 22 49.3	+ 4 49.9	−0.2445	0.5835	−0.0355	+21	−32
20 Geminorum	6½	3.09	7.3	17 51.5	23 6 11.4	+11 55.8	+0.8212	0.5804	0.0493	+90	+27
26 Geminorum	5½	3.01	8.1	17 45.4	10 29.6	− 7 55.4	+0.6984	0.5780	0.0581	+90	+18
51 Geminorum	5½	2.79	9.7	16 21.2	23 53.8	+ 4 59.9	+1.2359	0.5718	0.0812	+90	+59
λ Geminorum	4	2.78	9.9	16 44.9	24 1 57.6	+ 6 59.3	+0.6516	0.5705	0.0846	+85	+13
68 Geminorum	5½	+2.69	−10.6	+16 4.5	8 49.6	−10 23.2	+0.7415	0.5666	−0.0957	+90	+17
1 Cancri	6	2.55	11.9	16 5.9	19 19.9	− 0 14.6	−0.3701	0.5616	0.1110	+15	−48
12 Cancri	6½	2.45	11.7	13 58.6	25 0 42.8	+ 4 57.5	+1.2560	0.5584	0.1190	+90	+58
27 Cancri	5½	2.35	12.3	13 2.1	9 4.0	−10 58.1	+1.2218	0.5545	0.1294	+90	+51
29 Cancri	6	2.35	12.8	14 35.6	9 55.2	−10 8.5	−0.5464	0.5539	0.1305	+ 5	−63
A¹ Cancri	6	+2.27	−13.0	+13 5.8	16 47.7	− 3 29.6	+0.1227	0.5503	−0.1386	+43	−22
A² Cancri	6	2.24	12.9	12 32.1	18 34.4	− 1 46.4	+0.4754	0.5494	0.1407	+66	− 4
60 Cancri	6	2.19	13.0	12 4.1	22 51.9	+ 2 22.8	+0.3604	0.5475	0.1451	+58	−10
α Cancri	4	2.18	13.1	12 18.4	26 0 5.0	+ 3 33.6	−0.0714	0.5471	0.1462	+31	−34
κ Cancri	5	2.12	13.1	11 8.1	4 33.5	+ 7 53.5	+0.5222	0.5446	0.1508	+70	− 2
ω Leonis	5½	+2.01	−13.2	+ 9 33.7	14 40.0	− 6 19.1	+0.6445	0.5405	−0.1596	+82	+ 3
h Leonis	5½	1.99	13.4	10 13.7	16 22.9	− 4 39.5	−0.3467	0.5398	0.1610	+16	−53
B. A. C. 3407	6	1.89	13.2	8 52.0	27 5 24.9	+ 7 58.3	−1.0344	0.5348	0.1698	−25	−81
π Leonis	5	1.88	13.4	8 36.1	6 28.2	+ 8 59.7	−0.9282	0.5344	0.1704	−18	−82
14 Sextantis	6	1.86	12.9	6 10.7	9 48.8	−11 45.7	+1.1280	0.5334	0.1721	+90	+35
16 Sextantis	6	+1.85	−13.1	+ 6 44.5	11 3.0	−10 33.8	+0.3021	0.5331	−0.1728	+53	−17
34 Sextantis	6½	1.75	12.5	4 11.4	28 4 7.4	+ 6 0.0	+0.0655	0.5282	0.1797	+39	−31
36 Sextantis	6	1.74	12.3	3 6.0	5 25.9	+ 7 16.1	+1.0224	0.5277	0.1799	+90	+25
p³ Leonis	6	1.70	12.1	2 35.2	16 43.8	− 5 45.9	−0.4654	0.5258	0.1823	+10	−65
p⁵ Leonis	5½	+1.68	−11.7	+ 0 33.8	20 17.9	− 2 18.0	+1.1018	0.5252	−0.1825	+90	+31
NEW MOON.											
OCTOBER.											
α Virginis	1	+1.78	− 7.9	−10 33.1	1 17 11.5	− 7 24.4	+1.2930	0.5255	−0.1593	+80	+55
h Virginis	5	+1.76	− 7.5	− 9 33.8	21 14.2	− 3 28.8	−0.4392	0.5249	−0.1558	+ 8	−63
86 Virginis	6	1.83	7.1	11 50.5	2 3 55.2	+ 3 0.4	+1.0646	0.5274	0.1506	+78	+29
λ Virginis	4½	1.91	5.4	12 50.0	20 54.6	− 4 30.5	−0.2539	0.5309	0.1344	+16	−50
5 Libræ	6½	2.03	4.4	14 58.7	3 10 27.5	+ 8 38.0	+0.4095	0.5341	0.1190	+52	−13
α¹ Libræ	6	2.06	4.2	15 30.7	12 49.6	+10 55.6	+0.7225	0.5345	0.1165	+75	+ 6
α² Libræ	2½	+2.06	− 4.2	−15 33.4	12 55.4	+11 1.4	+0.7614	0.5345	−0.1165	+75	+ 8
ν¹ Libræ	6	2.12	3.2	15 48.2	20 46.6	− 5 21.8	+0.1611	0.5365	0.1067	+35	−26
ν² Libræ	6½	2.12	3.2	16 1.9	20 52.2	− 5 16.4	+0.4055	0.5365	0.1064	+51	−13
ζ¹ Libræ	6½	2.22	2.0	16 18.5	4 7 27.9	+ 4 59.6	−0.3441	0.5392	0.0923	+ 6	−57
ζ² Libræ	6	2.24	2.0	17 2.2	8 6.6	+ 5 37.1	+0.4051	0.5392	0.0919	+49	−12
ζ³ Libræ	6	+2.23	− 1.8	−16 12.5	8 39.3	+ 6 8.8	−0.5641	0.5396	−0.0908	− 6	−75
ζ⁴ Libræ	6	2.24	− 1.8	16 27.3	9 45.5	+ 7 12.9	−0.3901	0.5399	0.0893	+ 3	−60
ν² Scorpii	4	2.45	+ 0.2	19 9.3	5 4 42.1	+ 1 33.8	+1.1633	0.5444	0.0618	+71	+42
ν¹ Scorpii	6	2.45	0.2	19 8.8	4 42.2	+ 1 33.9	+1.1540	0.5444	0.0618	+71	+41
χ Ophiuchi	6	2.49	1.6	18 11.4	11 57.1	+ 8 34.9	−0.3111	0.5459	0.0506	+ 3	−55
B. A. C. 5580	6½	+2.59	+ 2.2	−19 42.0	19 0.6	− 8 35.2	+1.0361	0.5478	−0.0395	+71	+29
29 Ophiuchi	6	2.64	4.0	18 42.5	6 4 30.0	+ 0 35.7	−0.3573	0.5498	−0.0236	− 2	−58
B. A. C. 6060	6	2.93	8.0	18 46.7	7 5 47.7	+ 1 3.6	−0.3466	0.5541	+0.0189	− 2	−57
B. A C. 6294	6	3.08	11.0	18 28.7	22 13.5	− 7 3.4	−0.1278	0.5564	0.0465	+13	−43
ρ¹ Sagittarii	4	3.28	14.6	18 3.8	8 21 15.9	− 8 47.6	+0.9480	0.5590	0.0852	+72	+21
ν Sagittarii	4½	+3.25	+15.3	−16 10.1	21 19.7	− 8 44.0	−1.0688	0.5590	+0.0852	−41	−90
e¹ Sagittarii	6	3.35	16.5	16 33.2	9 5 58.5	− 0 22.8	+0.1433	0.5598	0.0994	+34	−27
e² Sagittarii	5	3.35	16.7	16 23.4	6 47.7	+ 0 24.8	+0.0530	0.5599	0.1008	+28	−32
B. A. C. 6746	6	3.34	16.9	15 44.2	7 16.4	+ 0 52.5	−0.5921	0.5599	0.1013	− 7	−78
g Sagittarii	5½	3.40	17.9	15 47.7	13 49.9	+ 7 12.6	+0.1707	0.5605	0.1118	+36	−25
β Capricorni	3	+3.47	+19.5	−15 8.6	10 0 18.2	− 6 40.5	+0.7340	0.5611	+0.1269	+75	+ 6
B. A. C. 7087	6	+3.50	+20.6	−14 7.1	6 17.3	− 0 53.5	+0.4457	0.5619	+0.1354	+56	−11

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
ν Aquarii	4½	+3.62	+22.8	-11 50.2	10 22 17.3	- 9 26.5	+0.4114	0.5637	+0.1562	+56	-13
17 Aquarii	6	3.64	23.9	9 48.7	11 4 19.2	- 3 37.0	-0.7098	0.5645	0.1632	- 8	-90
19 Aquarii	5½	3.65	23.9	10 14.4	5 20.0	- 2 38.4	-0.1028	0.5646	0.1644	+26	-41
ξ Aquarii	5	3.68	25.0	8 22.1	10 57.7	+ 2 47.6	-1.0752	0.5658	0.1707	-32	-90
B. A. C. 7562	6½	3.71	24.8	9 34.2	14 9.6	+ 5 52.8	+0.7050	0.5661	0.1737	+81	+ 7
c^1 Capricorni	5	+3.71	+24.8	- 9 36.7	14 11.5	+ 5 54.8	+0.7527	0.5661	+0.1737	+77	+ 7
c^2 Capricorni	6	3.72	24.7	9 48.5	14 46.7	+ 6 28.8	+1.0551	0.5662	0.1746	+80	+27
30 Aquarii	5½	3.75	25.9	7 4.8	22 21.5	-10 12.3	-0.3759	0.5676	0.1811	+13	-58
44 Aquarii	5½	3.79	26.5	5 57.9	12 4 30.2	- 4 16.4	-0.3744	0.5689	0.1866	+13	-58
51 Aquarii	5	3.81	26.8	5 25.2	7 36.0	- 1 17.1	-0.3416	0.5697	0.1888	+15	-56
κ Aquarii	5	+3.86	+27.1	- 4 49.3	13 37.2	+ 4 31.4	+0.2028	0.5710	+0.1927	+46	-24
κ Piscium	5½	4.02	27.8	+ 0 37.4	13 11 2.2	+ 1 10.7	-1.0069	0.5771	0.2007	-23	-90
9 Piscium	6	4.02	27.8	0 29.4	11 10.3	+ 1 18.5	-0.8478	0.5771	0.2007	-12	-90
15 Piscium	6½	4.04	27.6	0 40.5	14 42.9	+ 4 43.4	-0.3174	0.5782	0.2011	+18	-54
16 Piscium	6	4.05	27.8	1 27.7	15 6.7	+ 5 6.3	-1.0181	0.5785	0.2011	-24	-89
λ Piscium	5	+4.06	+27.5	+ 1 8.7	17 31.9	+ 7 26.3	-0.2163	0.5794	+0.2013	+23	-48
21 Piscium	6	4.07	27.3	0 26.0	20 41.1	+10 28.6	+1.1210	0.5803	0.2011	+90	+32
22 Piscium	6½	4.09	27.5	2 17.3	21 45.1	+11 30.3	-0.4976	0.5808	0.2010	+ 8	-67
25 Piscium	6	4.09	27.3	1 26.9	22 13.5	+11 57.6	+0.4266	0.5809	0.2009	+62	-12
51 Piscium	6	4.22	26.4	6 19.1	14 14 45.4	+ 3 53.1	-1.0772	0.5870	0.1961	-29	-84
60 Piscium	6½	+4.24	+25.5	+ 6 6.6	20 58.4	+ 9 52.1	+0.3383	0.5895	+0.1925	+56	-15
62 Piscium	6	4.26	25.5	6 40.1	21 20.3	+10 13.1	-0.1389	0.5895	0.1925	+27	-42
δ Piscium	4½	4.27	25.4	6 57.2	21 30.0	+10 22.5	-0.3888	0.5898	0.1922	+14	-58
ε Piscium	4	4.29	24.6	7 16.0	15 3 22.1	- 7 58.7	+0.4210	0.5917	0.1881	+62	-10
54 Ceti	6	4.41	21.3	10 28.2	22 42.5	+10 37.1	+0.7425	0.5993	0.1677	+90	+10
B. A. C. 609	6	+4.44	+20.5	+11 43.9	16 2 6.3	-10 7.1	+0.0717	0.6002	+0.1635	+39	-27
29 Arietis	6½	4.52	17.4	14 31.2	15 17.2	+ 2 32.6	-0.6294	0.6042	0.1405	0	-70
ο Arietis	6	4.54	16.1	14 49.1	19 50.4	+ 6 54.9	-0.2840	0.6054	0.1359	+19	-44
σ Arietis	5½	4.53	15.4	14 36.2	22 32.9	+ 9 30.9	+0.2890	0.6061	0.1309	+53	-12
NEPTUNE				16 5.9	17 10 2.8	- 3 26.8	+0.2081	0.6066	0.1106	+48	-14
B A. C. 1119	6	+4.52	+10.2	+16 9.5	17 6.3	+ 3 19.7	+0.8736	0.6087	+0.0957	+90	+26
B. A. C. 1240	6	4.53	7.6	17 51.9	18 1 19.2	+11 12.7	-0.0955	0.6087	0.0786	+30	-28
B. A. C. 1272	6	4.49	7.1	17 1.7	4 6.7	-10 6.7	+0.9434	0.6088	0.0724	+90	+33
δ^1 Tauri	4	4.47	5.4	17 16.2	9 52.4	- 4 34.9	+1.0849	0.6082	0.0597	+90	+45
δ^2 Tauri	5½	4.46	5.3	17 10.4	10 19.4	- 4 9.0	+1.2075	0.6082	0.0591	+90	+58
δ^3 Tauri	5	+4.47	+ 4.9	+17 39.6	10 51.2	- 3 38.5	+0.7577	0.6080	+0.0574	+90	+22
ε Tauri	3½	4.50	4.4	18 55.3	12 2.4	- 2 30.2	-0.4286	0.6077	0.0550	+11	-46
SATURN				19 54.4	16 11.4	+ 1 28.8	-1.2031	0.6091	0.0463	-47	-70
B. A. C. 1468	6	4.42	2.4	18 31.3	18 53.6	+ 4 4.5	+0.2923	0.6061	0.0396	+54	- 3
ι Tauri	5½	4.40	1.7	18 38.4	20 52.4	+ 5 58.6	+0.2477	0.6060	0.0353	+50	- 5
m Tauri	5½	+4.34	+ 0.2	+18 29.2	19 3 7.5	+11 58.8	+0.5808	0.6045	+0.0219	+77	+15
l Tauri	5½	4.40	- 0.4	20 15.7	3 15.6	-11 53.5	-1.1937	0.6045	+0.0215	-46	-70
119 Tauri	5	4.23	2.5	18 30.3	12 53.4	- 2 38.5	+0.6697	0.6008	0.0000	+89	+22
120 Tauri	6	4.23	2.6	18 27.4	13 24.6	- 2 8.6	+0 7186	0.6003	-0.0016	+90	+25
127 Tauri	6½	4.19	3.7	18 55.3	17 7.5	+ 1 25.6	+0.2322	0.5991	0.0089	+49	- 3
χ^1 Orionis	4½	+4.18	- 5.4	+20 15.1	21 41.4	+ 5 48.8	-1.1798	0.5970	-0.0191	-44	-70
χ^2 Orionis	5	4.16	5.2	19 43.4	21 55.1	+ 6 1.9	-0.6498	0.5970	0.0194	- 2	-62
χ^3 Orionis	6	4.12	6.0	19 41.3	20 1 20.5	+ 9 19.4	-0.6920	0.5954	0 0261	- 5	-67
χ^4 Orionis	5	4.14	6.2	20 8.3	1 31.0	+ 9 29.5	-1.1537	0.5948	0.0272	-41	-70
68 Orionis	6	4.08	6.9	19 48.8	4 48.2	-11 21.0	-0.9272	0.5932	0.0337	-20	-70
71 Orionis	6	+4.04	- 6.9	+19 11.5	5 58.1	-10 13.7	-0.3342	0.5926	-0.0360	+16	-38
20 Geminorum	6½	3.89	8.2	17 51.5	13 7.5	- 3 20.6	+0.7161	0.5889	0.0501	+90	+20
26 Geminorum	5½	3.84	9.2	17 45.3	17 18.7	+ 0 41.1	+0 5967	0.5860	0.0580	+79	+12
51 Geminorum	5½	3.60	11.3	16 21.2	21 6 23.3	-10 43.1	+1.1293	0.5780	0.0780	+90	+47
λ Geminorum	4	3.60	11.6	16 44.9	8 24.4	- 8 46.4	+0.5505	0.5763	0.0858	+74	+ 7
68 Geminorum	5½	+3.49	-12.5	+16 4.5	15 7.8	- 2 17.5	+0.6398	0.5723	-0.0962	+83	+11
1 Cancri	6	+3.35	-14.2	+16 5.9	22 1 26.8	+ 7 39.8	-0.4590	0.5652	-0.1122	+10	-54

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
12 Cancri	6½	+3.24	-14.5	+13 58.6	22 6 44.9	-11 13.0	+1.1540	0.5618	-0.1192	+90	+45
27 Cancri	5½	3.11	14.6	13 2.1	14 59.5	- 3 15.2	+1.1246	0.5568	0.1297	+90	+41
29 Cancri	6	3.12	15.2	14 35.5	15 50.1	- 2 26.3	-0.6285	0.5560	0.1308	0	-70
A¹ Cancri	6	3.01	15.6	13 5.7	22 38.5	+ 4 8.6	+0.0371	0.5517	0.1388	+37	-27
A² Cancri	6	2.97	15.6	12 32.0	23 0 24.3	+ 5 50.8	+0.3858	0.5505	0.1407	+60	- 9
60 Cancri	6	+2.91	-15.9	+12 4.0	4 39.6	+ 9 57.8	+0.2784	0.5484	-0.1449	+52	-15
α Cancri	4	2.91	16.1	12 18.3	5 52.3	+11 8.2	-0.1544	0.5476	0.1461	+27	-39
κ Cancri	5	2.82	16.0	11 8.0	10 19.3	- 8 33.5	+0.4376	0.5457	0.1500	+63	- 7
ω Leonis	5½	2.70	16.1	9 33.6	20 23.2	+ 1 11.4	+0.5669	0.5400	0.1587	+74	- 1
k Leonis	5½	2.68	16.4	10 13.6	22 5.9	+ 2 50.9	-0.4225	0.5395	0.1601	+12	-58
B. A. C. 3407	6	+2.53	-16.5	+ 8 51.9	24 11 7.1	- 8 32.0	-1.1023	0.5337	-0.1686	-31	-81
π Leonis	5	2.52	16.5	8 36.0	12 10.5	- 7 30.6	-0.9947	0.5331	0.1691	-23	-82
14 Sextantis	6	2.45	15.8	6 10.6	15 31.2	- 4 15.9	+1.0595	0.5316	0.1711	+90	+29
16 Sextantis	6	2.45	16.0	6 44.4	16 45.5	- 3 3.9	+0.2365	0.5313	0.1717	+49	-21
34 Sextantis	6½	2.29	15.4	4 11.3	25 9 53.1	-10 26.9	+0.0091	0.5260	0.1782	+36	-34
35 Sextantis	6½	+2.29	-15.8	+ 5 21.4	10 14.6	-10 6.1	-1.3292	0.5259	-0.1783	-61	-85
36 Sextantis	6	2.28	15.1	3 5.9	11 12.1	- 9 10.3	+0.9640	0.5255	0.1786	+90	+21
*p*³ Leonis	6	2.23	14.9	2 35.2	22 33.2	+ 1 50.8	-0.5166	0.5230	0.1807	+ 7	-69
*p*⁵ Leonis	5½	2.17	14.3	+ 0 33.8	26 2 8.4	+ 5 19.9	+1.0529	0.5226	0.1811	+90	+27
υ Leonis	5	2.08	13.9	- 0 10.9	14 20.4	- 6 49.3	-0.3394	0.5216	0.1812	+17	-56
f Virginis	6	+1.97	-10.9	- 5 11.5	27 21 59.2	- 0 5.1	-0.4432	0.5216	-0.1732	+10	-63
28 Virginis	6	1.96	10.4	6 51.5	28 0 42.3	+ 2 33.4	+0.9347	0.5219	0.1720	+83	+18
B. A. C. 4394	6	1.94	9.3	8 21.5	14 40.2	- 7 53.0	+0.2479	0.5237	0.1643	+48	-22
k Virginis	5	+1.93	- 8.0	- 9 33.8	29 3 24.0	+ 4 28.5	-0.4501	0.5262	-0.1552	+ 7	-64
NEW MOON.											
NOVEMBER.											
ν² Scorpii	4	+2.23	+ 1.1	-19 9.3	1 10 44.6	+ 9 23.7	+1.1784	0.5465	-0.0619	+71	+42
ν¹ Scorpii	6	2.23	1.1	19 8.8	10 44.7	+ 9 23.8	+1.1692	0.5465	0.0619	+71	+43
χ Ophiuchi	6	+2.25	+ 2.3	-18 11.4	17 59.1	- 7 35.7	-0.2988	0.5476	-0.0509	+ 4	-54
B. A. C. 5580	6½	2.32	3.0	19 41.9	2 1 2.3	- 0 46.0	+1.0500	0.5492	0.0387	+71	+30
29 Ophiuchi	6	2.35	4.6	18 42.5	10 32.2	+ 8 25.4	-0.3455	0.5507	-0.0237	- 1	-57
B. A. C. 6060	6	2.53	8.3	18 46.7	3 11 56.0	+ 8 59.3	-0.3340	0.5535	+0.0186	- 1	-56
B. A. C. 6294	6	2.66	11.1	18 28.7	4 4 31.0	+ 1 1.6	-0.1198	0.5541	0.0468	+13	-42
ρ¹ Sagittarii	4	+2.82	+14.1	-18 3.8	5 3 54.8	- 0 21.1	+0.9652	0.5543	+0.0847	+72	+23
ν Sagittarii	4½	2.79	14.7	16 10.2	3 58.7	- 0 17.4	-1.0713	0.5543	0.0847	-41	-90
*e*¹ Sagittarii	6	2.87	15.8	16 33.2	12 48.3	+ 8 14.6	+0.1539	0.5542	0.0983	+34	-26
*e*² Sagittarii	5	2.88	15.9	16 23.4	13 38.7	+ 9 3.4	+0.0608	0.5541	0.0997	+29	-32
B. A. C. 6746	6	2.86	16.2	15 44.2	14 8.1	+ 9 31.9	-0.5920	0.5541	0.1001	- 7	-78
g Sagittarii	5½	+2.92	+17.0	-15 47.7	20 50.7	- 7 58.9	+0.1782	0.5539	+0.1102	+37	-25
β Capricorni	3	3.01	18.3	15 8.6	6 7 35.5	+ 2 24.5	+0.7480	0.5539	0.1255	+75	+ 7
B. A. C. 7087	6	3.06	19.4	14 7.1	13 44.9	+ 8 21.7	+0.4538	0.5539	0.1337	+57	-10
ν Aquarii	4½	3.18	21.6	11 50.2	7 6 15.2	+ 0 19.2	+0.4178	0.5542	0.1534	+56	-12
17 Aquarii	6	3.23	22.8	9 48.7	12 29.1	+ 6 20.7	-0.7230	0.5547	0.1606	- 8	-90
19 Aquarii	5½	+3.25	+22.7	-10 14.4	13 32.0	+ 7 21.5	-0.1062	0.5550	+0.1618	+26	-41
ξ Aquarii	5	3.28	23.6	8 22.1	19 21.7	-11 0.5	-1.0965	0.5555	0.1672	-33	-90
B. A. C. 7562	6½	3.32	23.4	9 34.2	22 40.2	- 7 48.5	+0.7131	0.5559	0.1706	+81	+ 4
*c*¹ Capricorni	5	3.32	23.4	9 36.7	22 42.3	- 7 46.5	+0.7616	0.5559	0.1706	+81	+ 7
*c*² Capricorni	6	3.33	23.3	9 48.5	23 18.8	- 7 11.2	+1.0693	0.5559	0.1710	+81	+29
30 Aquarii	5½	+3.38	+24.5	- 7 4.8	8 7 9.9	+ 0 24.0	-0.3856	0.5568	+0.1778	+12	-59
44 Aquarii	5½	3.44	25.0	5 57.9	13 31.8	+ 6 33.1	-0.3839	0.5580	0.1828	+13	-59
51 Aquarii	5	3.47	25.3	5 25.2	16 44.6	+ 9 39.4	-0.3540	0.5588	0.1850	+15	-57
κ Aquarii	5	3.53	25.8	- 4 49.4	22 58.7	- 8 19.2	+0.2028	0.5602	0.1888	+46	-24
κ Piscium	5½	3.77	26.9	+ 0 37.3	9 21 8.1	-10 55.3	-1.0264	0.5669	0.1970	-25	-90
9 Piscium	6	+3.77	+26.9	+ 0 29.3	21 16.5	-10 47.2	-0.8652	0.5669	+0.1970	-14	-90
15 Piscium	6½	+3.81	+26.6	+ 0 40.4	10 0 55.8	- 7 15.6	-0.3285	0.5684	+0.1976	+17	-55

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
16 Piscium	6	+3.82	+26.9	+ 1 27.6	10 1 20.3	− 6 51.9	−1.0387	0.5685	+0.1977	−26	−89
λ Piscium	5	3.84	26.6	1 8.6	3 50.1	− 4 27.3	−0.2242	0.5696	0.1979	+23	−48
21 Piscium	6	3.87	26.2	0 25.9	7 5.1	− 1 19.2	+1.1303	0.5709	0.1979	+90	+33
22 Piscium	6½	3.89	26.6	2 17.2	8 11.1	− 0 15.5	−0.5107	0.5712	0.1979	+ 7	−68
25 Piscium	6	3.90	26.3	1 26.8	8 40.1	+ 0 12.5	+0.4272	0.5716	0.1979	+62	−12
51 Piscium	6	+4.14	+26.2	+ 6 19.1	11 1 38.3	− 7 25.9	−1.0932	0.5798	+0.1938	−30	−84
60 Piscium	6½	4.19	25.4	6 6.6	7 59.5	− 1 18.6	+0.3364	0.5828	0.1905	+56	−16
62 Piscium	6	4.20	25.4	6 40.1	8 21.7	− 0 57.3	−0.1451	0.5829	0.1904	+27	−42
δ Piscium	4½	4.22	25.5	6 57.2	8 31.6	− 0 47.8	−0.3974	0.5833	0.1901	+14	−58
ε Piscium	4	4.27	24.7	7 16.0	14 30.3	+ 4 57.7	+0.4209	0.5864	0.1861	+62	−10
π Piscium	5½	+4.51	+22.7	+11 33.0	12 4 31.2	− 5 33.1	−1.2668	0.5940	+0.1733	−51	−79
54 Ceti	6	4.53	21.4	10 28.2	10 5.5	− 0 11.6	+0.7435	0.5965	0.1675	+90	+10
B. A. C. 609	6	4.57	21.0	11 44.0	13 30.6	+ 3 5.6	+0.0702	0.5983	0.1628	+39	−27
29 Arietis	6½	4.77	18.1	14 31.2	13 2 43.1	− 8 13.2	−0.6258	0.6047	0.1439	0	−70
ο Arietis	6	4.79	16.8	14 49.1	7 15.7	− 3 51.5	−0.2802	0.6067	0.1367	+20	−44
σ Arietis	5½	+4.80	+15.9	+14 36.2	9 57.4	− 1 16.2	+0.2932	0.6080	+0.1319	+53	−11
NEPTUNE				15 53.8	19 49.9	+ 8 12.3	+0.2412	0.6128	0.1139	+50	−12
B. A. C. 1119	6	4.94	10.7	16 9.5	14 4 19.6	− 7 38.7	+0.8790	0.6138	0.0971	+90	+26
B. A. C. 1240	6	5.00	8.0	17 51.9	12 24.0	+ 0 5.7	−0.0800	0.6152	0.0791	+31	−27
B. A. C. 1272	6	4.98	7.3	17 1.7	15 8.4	+ 2 43.3	+0.9480	0.6153	0.0736	+90	+33
δ^1 Tauri	4	+4.99	+ 5.5	+17 16.2	20 46.8	+ 8 7.8	+1.0919	0.6158	+0.0607	+90	+46
δ^2 Tauri	5½	4.98	5.4	17 10.4	21 13.3	+ 8 33.2	+1.2134	0.6158	0.0601	+90	+59
δ^3 Tauri	5	5.00	5.1	17 39.6	21 44.3	+ 9 2.9	+0.7665	0.6158	0.0586	+90	+22
ε Tauri	3½	5.04	4.6	18 55.3	22 53.9	+10 9.6	−0.4079	0.6158	0.0560	+12	−45
SATURN				19 37.0	15 0 9.3	+11 21.9	−1.0231	0.6191	0.0539	−28	−71
B. A. C. 1468	6	+5.02	+ 2.5	+18 31.3	5 35.0	− 7 25.8	+0.3088	0.6155	+0.0406	+55	− 2
i Tauri	5½	5.02	+ 1.8	18 38.4	7 30.7	− 5 34.9	+0.2663	0.6152	0.0360	+52	− 4
m Tauri	5½	4.98	− 0.1	18 29.2	13 35.6	+ 0 15.0	+0.5966	0.6142	0.0221	+79	+16
l Tauri	5½	5.04	0.4	20 15.7	13 43.4	+ 0 22.4	−1.1556	0.6141	0.0218	−41	−70
119 Tauri	5	4.93	3.1	18 30.2	23 4.2	+ 9 20.3	+0.6885	0.6112	+0.0007	+90	+23
120 Tauri	6	+4.92	− 3.3	+18 27.3	23 34.4	+ 9 49.2	+0.7367	0.6109	−0.0010	+90	+26
127 Tauri	6½	4.90	4.6	18 55.3	16 3 10.3	−10 43.5	+0.2555	0.6098	0.0086	+51	− 2
χ^1 Orionis	4½	4.92	6.1	20 15.1	7 35.3	− 6 29.2	−1.1324	0.6078	0.0191	−39	−70
χ^2 Orionis	5	4.90	6.1	19 43.4	7 48.6	− 6 16.5	−0.6085	0.6075	0.0195	0	−58
χ^3 Orionis	6	4.86	7.1	19 41.3	11 7.2	− 3 5.8	−0.6513	0.6061	0.0265	− 2	−63
χ^4 Orionis	5	+4.88	− 7.4	+20 8.3	11 17.5	− 2 56.0	−1.1064	0.6061	−0.0267	−36	−70
68 Orionis	6	4.84	8.1	19 48.8	14 27.9	+ 0 6.8	−0.8798	0.6042	0.0344	−17	−70
71 Orionis	6	4.81	8.2	19 11.5	15 35.4	+ 1 11.7	−0.2957	0.6035	0.0366	+18	−36
20 Geminorum	6½	4.68	9.7	17 51.4	22 30.1	+ 7 50.0	+0.7433	0.5997	0.0512	+90	+22
26 Geminorum	5½	4.63	10.9	17 45.3	17 2 32.6	+11 43.0	+0.6240	0.5971	0.0596	+82	+14
51 Geminorum	5½	+4.43	−13.5	+16 21.2	15 9.9	− 0 8.7	+1.1519	0.5891	−0.0831	+90	+49
λ Geminorum	4	4.42	14.1	16 44.9	17 6.8	+ 1 43.9	+0.5844	0.5878	0.0865	+77	+ 9
68 Geminorum	5½	4.33	15.4	16 4.4	23 36.3	+ 7 58.8	+0.6790	0.5826	0.0981	+89	+13
1 Cancri	6	4.20	17.1	16 5.8	18 9 34.7	− 6 24.6	−0.4003	0.5751	0.1139	+13	−50
12 Cancri	6½	4.07	17.3	13 58.5	14 42.5	− 1 27.7	+1.1899	0.5714	0.1209	+90	+49
27 Cancri	5½	+3.95	−18.4	+13 2.0	22 41.8	+ 6 14.8	+1.1636	0.5654	−0.1316	+90	+45
29 Cancri	6	3.98	19.0	14 35.5	23 30.8	+ 7 2.0	−0.5657	0.5645	0.1327	+ 4	−65
A^1 Cancri	6	3.85	19.6	13 5.7	19 6 7.4	−10 34.9	+0.0924	0.5603	0.1403	+41	−24
A^2 Cancri	6	3.81	19.7	12 32.0	7 50.1	− 8 55.7	+0.4379	0.5586	0.1423	+64	− 6
60 Cancri	6	3.75	20.1	12 4.0	11 58.6	− 4 55.5	+0.3290	0.5558	0.1467	+55	−12
α Cancri	4	+3.75	−20.1	+12 18.3	13 9.2	− 3 47.3	−0.0928	0.5554	−0.1477	+30	−35
κ Cancri	5	3.67	20.1	11 8.0	17 29.2	+ 0 24.1	+0.4912	0.5517	0.1522	+68	− 4
ω Leonis	5½	3.53	20.5	9 33.6	20 3 18.9	+ 9 54.6	+0.6206	0.5461	0.1602	+79	+ 2
k Leonis	5½	3.51	20.9	10 13.6	4 59.3	+11 31.9	−0.3556	0.5449	0.1615	+16	−53
B. A. C. 3407	6	3.35	21.2	8 51.8	17 45.2	− 0 6.4	−1.0273	0.5374	0.1699	−25	−81
π Leonis	5	+3.33	−21.2	+ 8 35.9	18 47.5	+ 0 53.9	−0.9208	0.5371	−0.1706	−17	−82
14 Sextantis	6	+3.26	−20.3	+ 6 10.6	22 4.9	+ 4 5.3	+1.1120	0.5356	−0.1722	+90	+34

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
16 Sextantis	6	+3.26	-20.6	+ 6 44.4	20 23 18.0	+ 5 16.1	+0.2971	0.5351	-0.1728	+53	-16
34 Sextantis	6½	3.05	19.9	4 11.3	21 16 12.0	- 2 20.5	+0.0740	0.5279	0.1789	+40	-29
36 Sextantis	6	3.04	19.6	3 5.9	17 30.1	- 1 4.8	+1.0205	0.5270	0.1794	+90	+25
p^{3} Leonis	6	2.92	19.4	2 35.1	22 4 45.5	+ 9 50.6	-0.4502	0.5238	0.1811	-10	-64
p^{5} Leonis	5½	2.88	18.6	0 33.7	8 19.4	-10 41.8	+1.1110	0.5231	0.1815	+90	+32
76 Leonis	6½	+2.85	-19.2	+ 2 17.2	11 0.3	- 8 5.6	-1.2575	0.5224	-0.1815	-47	-88
υ Leonis	5	2.78	18.0	- 0 11.0	20 27.9	+ 1 5.6	-0.2758	0.5206	0.1812	+20	-52
f Virginis	6	2.58	14.4	5 11.5	24 4 6.2	+ 7 49.3	-0.3925	0.5199	0.1731	+14	-60
28 Virginis	6	2.58	13.8	6 51.5	6 49.7	+10 28.1	+0.9790	0.5199	0.1717	+83	+21
B. A. C. 4394	6	2.50	12.3	8 21.6	20 49.6	+ 0 3.8	+0.2901	0.5217	0.1653	+50	-19
58 Virginis	6	+2.49	-11.5	- 9 56.1	25 1 29.6	+ 4 35.6	+1.2779	0.5229	-0.1611	+89	+52
α Virginis	1	2.47	11.1	10 33.2	5 31.9	+ 8 30.8	+1.3189	0.5235	0.1584	+80	+62
h Virginis	5	2.43	10.8	9 33.9	9 35.5	-11 32.6	-0.4146	0.5241	0.1555	+ 9	-61
86 Virginis	6	2.43	9.5	11 50.6	16 18.2	- 5 1.7	+1.0887	0.5258	0.1506	+78	+31
λ Virginis	4½	2.36	7.4	12 50.0	26 9 19.1	+11 29.0	-0.2390	0.5305	0.1351	+17	-50
5 Libræ	6½	+2.38	- 5.2	-14 58.7	22 51.1	+ 0 36.4	+0.4203	0.5358	-0.1199	+53	-12
α^{1} Libræ	6	2.38	4.9	15 30.7	27 1 12.8	+ 2 53.7	+0.7331	0.5356	0.1176	+74	+ 6
α^{2} Libræ	2½	2.38	4.9	15 33.4	1 18.6	+ 2 59.5	+0.7722	0.5356	0.1176	+75	+ 9
ν^{1} Libræ	6	2.36	3.7	15 48.2	9 8.3	+10 34.7	+0.1646	0.5383	0.1079	+36	-26
ν^{2} Libræ	6½	2.37	- 3.6	16 1.9	9 13.7	+10 40.0	+0.4089	0.5383	-0.1076	+51	-12
				NEW	*MOON.*						
B. A. C. 6060	6	+2.44	+ 8.3	-18 46.7	30 17 42.3	- 7 27.0	-0.4103	0.5569	+0.0179	- 5	-62

DECEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
B. A. C. 6294	6	+2.49	+10.8	-18 28.7	1 10 10.7	+ 8 28.6	-0.2106	0.5572	+0.0456	+ 8	-48
ρ^{1} Sagittarii	4	2.57	13.9	18 3.8	2 9 29.0	+ 7 0.4	+0.8574	0.5560	0.0843	+72	+15
ν Sagittarii	4½	2.54	14.3	16 10.2	9 32.8	+ 7 4.0	-1.1833	0.5560	0.0883	-51	-90
e^{1} Sagittarii	6	2.59	15.1	16 33.2	18 22.3	- 8 24.0	+0.0341	0.5552	0.0973	+27	-33
e^{2} Sagittarii	5	+2.58	+15.4	-16 23.4	19 12.8	- 7 35.2	-0.0592	0.5551	+0.0987	+22	-39
B. A. C. 6746	6	2.57	15.5	15 44.2	19 41.9	- 7 7.0	-0.7126	0.5551	0.0998	-14	-90
g Sagittarii	5½	2.64	16.2	15 47.7	3 2 25.5	- 0 36.8	+0.0537	0.5542	0.1099	+29	-32
β Capricorni	3	2.70	17.3	15 8.6	13 13.5	+ 9 49.9	+0.6186	0.5530	0.1243	+68	- 1
B. A. C. 7087	6	2.72	18.3	14 7.1	19 25.6	- 8 10.2	+0.3200	0.5524	0.1328	+47	-17
ν Aquarii	4½	+2.81	+20.3	-11 50.3	4 12 7.7	+ 7 59.0	+0.2788	0.5508	+0.1522	+47	-20
17 Aquarii	6	2.86	21.3	9 48.7	18 27.8	- 9 53.2	-0.8782	0.5505	0.1591	-18	-90
19 Aquarii	5½	2.87	21.3	10 14.4	19 31.8	- 8 51.4	-0.2551	0.5505	0.1601	+18	-50
ξ Aquarii	5	2.91	22.2	8 22.1	5 1 28.0	- 3 6.7	-1.2595	0.5503	0.1658	-51	-90
B. A. C. 7562	6½	2.95	22.0	9 34.2	4 50.8	+ 0 9.5	+0.5692	0.5503	0.1687	+70	- 4
c^{1} Capricorni	5	+2.95	+22.0	- 9 36.7	4 53.0	+ 0 11.6	+0.6200	0.5503	+0.1687	+74	- 1
c^{2} Capricorni	6	2.96	21.9	9 48.5	5 30.1	+ 0 47.5	+0.9294	0.5503	0.1692	+80	+18
30 Aquarii	5½	3.02	23.0	7 4.8	13 32.2	+ 8 33.9	-0.5459	0.5505	0.1758	+ 4	-72
44 Aquarii	5½	3.07	23.4	5 57.9	20 4.3	- 9 6.9	-0.5440	0.5507	0.1802	+ 4	-71
51 Aquarii	5	3.11	23.6	5 25.2	23 22.4	- 5 55.2	-0.5135	0.5511	0.1822	+ 6	-69
κ Aquarii	5	+3.17	+24.0	- 4 49.4	5 47.4	+ 0 17.2	+0.0502	0.5517	+0.1861	+37	-32
κ Piscium	5½	3.47	25.3	+ 0 37.3	7 4 41.7	- 1 34.0	-1.1945	0.5565	0.1938	-39	-90
9 Piscium	6	3.47	25.3	0 29.3	4 50.4	- 1 25.6	-1.0306	0.5565	0.1938	-25	-90
15 Piscium	6½	3.51	25.1	0 40.4	8 37.9	+ 2 14.3	-0.4809	0.5576	0.1943	+ 9	-66
16 Piscium	6	3.52	25.4	1 27.6	9 3.3	+ 2 38.8	-1.2039	0.5576	0.1944	-40	-89
λ Piscium	5	+3.55	+25.1	+ 1 8.6	11 38.8	+ 5 9.2	-0.3747	0.5586	+0.1945	+15	-58
21 Piscium	6	3.58	24.6	0 25.9	15 1.2	+ 8 24.6	+1.0081	0.5597	0.1945	+90	+24
22 Piscium	6½	3.61	25.3	2 17.2	16 9.7	+ 9 30.8	-0.6625	0.5599	0.1945	- 1	-83
25 Piscium	6	3.61	25.0	1 26.8	16 39.9	+10 0.1	+0.2904	0.5603	0.1945	+52	-19
51 Piscium	6	3.88	25.0	6 19.1	8 10 18.3	+ 3 2.0	-1.2445	0.5672	0.1905	-45	-84
60 Piscium	6½	+3.98	+24.0	+ 6 6.6	16 54.4	+ 9 24.2	+0.2181	0.5707	+0.1874	+48	-22
62 Piscium	6	+3.98	+24.1	+ 6 40.1	17 17.5	+ 9 46.5	-0.2717	0.5707	+0.1874	+20	-49

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					LIMITING PARALLELS.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
δ Piscium	4½	+4.00	+24.1	+ 6 57.2	8 17 27.9	+ 9 56.5	−0.5284	0.5711	+0.1870	+ 6	−68
ε Piscium	4	4.08	23.4	7 16.0	23 40.6	− 8 4.0	+0.3094	0.5746	0.1833	+54	−16
54 Ceti	6	4.43	20.6	10 28.1	9 19 59.3	+11 30.2	+0.6640	0.5859	0.1655	+85	+ 6
B. A. C. 609	6	4.50	20.2	11 43.9	23 31.4	− 9 5.6	−0.0149	0.5883	0.1614	+34	−31
29 Arietis	6½	4.76	17.6	14 31.2	10 13 9.0	+ 4 0.9	−0.7013	0.5955	0.1434	− 4	−75
ο Arietis	6	+4.82	+16.5	+14 49.1	17 49.1	+ 8 30.2	−0.3445	0.5981	+0.1358	+16	−48
σ Arietis	5½	4.85	15.7	14 36.2	20 35.1	+11 9.7	+0.2389	0.5996	0.1313	+49	−14
NEPTUNE				15 42.5	11 5 33.0	− 4 13.6	+0.2567	0.6054	0.1159	+51	−12
B. A. C. 1119	6	5.09	10.4	16 9.5	15 20.9	+ 5 10.8	+0.8598	0.6084	0.0977	+90	+25
B. A. C. 1240	6	5.24	7.8	17 51.9	23 32.6	−10 57.4	−0.0953	0.6115	0.0802	+30	−28
B. A. C. 1272	6	+5.22	+ 6.9	+17 1.7	12 2 18.9	− 8 17.8	+0.9469	0.6122	+0.0752	+90	+33
SATURN				19 17.0	7 53.2	− 2 57.3	−0.8962	0.6169	0.0630	−18	−71
δ^1 Tauri	4	5.26	4.9	17 16.2	8 0.5	− 2 50.2	+1.0980	0.6134	0.0622	+90	+46
δ^2 Tauri	5½	5.27	4.8	17 10.4	8 27.1	− 2 24.6	+1.2181	0.6135	0.0609	+90	+59
δ^3 Tauri	5	5.29	4.5	17 39.6	8 58.5	− 1 54.5	+0.7711	0.6137	0.0601	+90	+23
ε Tauri	3½	+5.34	+ 4.4	+18 55.3	10 8.6	− 0 47.3	−0.4044	0.6138	+0.0575	+12	−45
B. A. C. 1468	6	5.38	2.0	18 31.3	15 51.8	+ 4 39.2	+0.3256	0.6142	0.0446	+56	− 1
i Tauri	5½	5.39	+ 1.5	18 38.4	18 47.6	+ 7 30.4	+0.2847	0.6148	0.0378	+53	− 3
m Tauri	5½	5.39	− 0.8	18 29.2	13 0 52.6	−10 39.7	+0.6263	0.6149	0.0239	+83	+17
l Tauri	5½	5.45	0.7	20 15.7	1 0.5	−10 32.2	−1.1262	0.6149	0.0237	−38	−70
119 Tauri	5	+5.38	− 4.0	+18 30.2	10 19.1	− 1 36.4	+0.7336	0.6141	+0.0025	+90	+26
120 Tauri	6	5.38	4.2	18 27.3	10 49.1	− 1 7.7	+0.7816	0.6139	+0.0008	+90	+28
127 Tauri	6½	5.40	5.5	18 55.3	14 23.4	+ 2 17.9	+0.3077	0.6132	−0.0069	+54	+ 1
χ^1 Orionis	4½	5.44	6.9	20 15.1	18 45.8	+ 6 29 6	−1.0671	0.6120	0.0174	−32	−70
χ^2 Orionis	5	5.42	7.0	19 43.4	18 58.9	+ 6 42.1	−0.5451	0.6122	0.0177	+ 4	−52
χ^3 Orionis	6	+5.40	− 8.2	+19 41.3	22 15.3	+ 9 50.6	−0.5824	0.6109	−0.0249	+ 2	−56
χ^4 Orionis	5	5.42	8.2	20 8.3	22 25.3	+10 0.1	−1.0351	0.6108	0.0259	−29	−70
68 Orionis	6	5.40	9.1	19 48.7	14 1 33.3	−10 59.5	−0.8023	0.6094	0.0329	−12	−70
71 Orionis	6	5.38	9.4	19 11.4	2 39.9	− 9 55.6	−0.2210	0.6091	0.0352	+23	−31
20 Geminorum	6½	5.31	11.5	17 51.4	9 28.0	− 3 23.8	+0.8233	0.6060	0.0501	+90	+27
26 Geminorum	5½	+5.20	−12.0	+17 45.3	13 26.1	+ 0 24.8	+0.7114	0.6040	−0.0585	+90	+19
51 Geminorum	5½	5.11	16.2	16 21.1	15 1 47.1	−11 43.3	+1.2537	0.5971	0.0830	+90	+63
λ Geminorum	4	5.13	16.7	16 44.8	3 41.2	− 9 53.6	+0.6948	0.5960	0.0867	+90	+15
68 Geminorum	5½	5.06	18.3	16 4.4	10 1.0	− 3 48.3	+0.7936	0.5920	0.0979	+90	+20
1 Cancri	6	4.98	20.4	16 5.8	19 43.1	+ 5 32.0	−0.2581	0.5846	0.1143	+20	−41
5 Cancri	6½	+4.96	−20.9	+16 46.4	21 36.2	+ 7 20.9	−1.1679	0.5832	−0.1173	−40	−73
29 Cancri	6	4.79	22.8	14 35.4	16 9 14.7	− 5 26.0	−0.4009	0.5749	0.1336	+13	−53
A^1 Cancri	6	4.68	23.4	13 5.6	15 39.0	+ 0 44.7	+0.2580	0.5698	0.1419	+51	−15
A^2 Cancri	6	4.64	23.7	12 31.9	17 18.7	+ 2 20.9	+0.6010	0.5690	0.1434	+78	+ 4
60 Cancri	6	4.59	24.1	12 3.9	21 19.4	+ 6 13.3	+0.5007	0.5661	0.1480	+68	− 2
α Cancri	4	+4.59	−24.4	+12 18.2	22 27.6	+ 7 19.2	+0.0830	0.5645	−0.1496	+40	−25
κ Cancri	5	4.51	24.5	11 7.9	17 2 39.7	+11 22.6	+0.6639	0.5616	0.1539	+85	+ 6
ω Leonis	5½	4.39	25.3	9 33.5	12 11.2	− 3 25.1	+0.8023	0.5554	0.1622	+90	+13
k Leonis	5½	4.37	25.7	10 13.5	13 48.6	− 1 51.0	−0.1589	0.5543	0.1636	+27	−41
ο Leonis	3½	4.34	26.2	10 25.0	18 7.5	+ 2 19.5	−1.0750	0.5513	0.1668	−29	−80
B. A. C. 3407	6	+4.21	−26.2	+ 8 51.8	18 2 11.8	+10 8.1	−0.8132	0.5463	−0.1720	−10	−81
π Leonis	5	4.20	26.2	8 35.9	3 12.3	+11 6.6	−0.7063	0.5454	0.1724	− 4	−82
14 Sextantis	6	4.13	25.6	6 10.5	6 23.9	− 9 47.9	+1.3044	0.5436	0.1744	+90	+58
16 Sextantis	6	4.13	25.8	6 44.3	7 35.0	− 8 39.1	+0.4998	0.5428	0.1749	+68	− 6
43 Leonis	6½	4.06	26.1	7 7.7	14 17.7	− 2 9.1	−1.0977	0.5394	0.1777	−31	−83
34 Sextantis	6½	+3.93	−25.5	+ 4 11.2	19 0 2.7	+ 7 18.0	+0.2891	0.5344	−0.1809	+53	−19
35 Sextantis	6½	3.94	26.0	5 21.3	0 23.4	+ 7 38.1	−1.0245	0.5346	0.1809	−25	−85
36 Sextantis	6	3.92	25.2	3 5.8	1 19.0	+ 8 31.9	+1.2269	0.5343	0.1812	+90	+44
p^3 Leonis	6	3.81	24.9	2 35.0	12 19.4	− 4 47.7	−0.2246	0.5293	0.1829	+23	−48
p^5 Leonis	5½	3.77	24.1	0 33.6	15 48.7	− 1 24.6	+1.3207	0.5279	0.1830	+90	+58
76 Leonis	6½	+3.75	−24.8	+ 2 17.1	18 26.5	+ 1 8.4	−1.0254	0.5270	−0.1830	−24	−88
ν Leonis	5	+3.66	−23.6	− 0 11.1	20 3 44.2	+10 9.6	−0.0507	0.5243	−0.1827	+32	−38

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1883.0. Δα	Red'ns from 1883.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
f Virginis	6	+3.41	-19.7	- 5 11.6	21 11 0.5	- 7 28.7	-0.1815	0.5208	-0.1740	+24	-46
28 Virginis	6	3.39	18.9	6 51.6	13 42.8	- 4 51.2	+1.1830	0.5207	0.1726	+83	+38
B. A. C. 4394	6	3.30	17.0	8 21.7	22 3 38.9	+ 8 40.7	+0.4876	0.5213	0.1649	+64	- 9
k Virginis	5	3.22	16.4	9 34.0	16 23.4	- 2 57.1	-0.2270	0.5234	0.1561	+20	-49
86 Virginis	6	3.20	13.6	11 50.6	23 6.1	+ 3 33.8	+1.2647	0.5244	0.1510	+78	+50
λ Virginis	4½	+3.10	-10.9	-12 50.1	23 16 8.5	- 3 54.0	-0.0795	0.5286	-0.1357	+25	-40
5 Libræ	6½	3.07	8.3	14 58.7	24 5 42.4	+ 9 15.4	+0.5454	0.5330	0.1209	+63	- 5
μ Libræ	6	3.03	8.4	13 39.7	7 24.9	+10 54.7	-1.1089	0.5334	0.1189	-40	-90
α^1 Libræ	6	3.06	7.8	15 30.7	8 4.5	+11 33.1	+0.8650	0.5335	0.1185	+75	+15
α^2 Libræ	2½	3.06	7.8	15 33.4	8 10.3	+11 38.7	+0.9020	0.5334	0.1182	+74	+18
ν^1 Libræ	6	+3.01	- 6.5	-15 48.2	16 1.0	- 4 44.9	+0.2863	0.5365	-0.1088	+43	-19
ν^2 Libræ	6½	3.02	6.5	16 1.9	16 6.5	- 4 39.6	+0.5302	0.5365	0.1088	+60	- 5
o^1 Libræ	6	2.96	5.5	15 7.6	23 8.5	+ 2 9.4	-1.2073	0.5391	0.1001	-53	-90
ζ^1 Libræ	6½	2.97	4.6	16 18.6	25 2 40.5	+ 5 34.7	-0.2399	0.5403	0.0948	+12	-50
ζ^2 Libræ	6	2.97	4.4	17 2.3	3 19.0	+ 6 12.0	+0.5054	0.5401	0.0944	+56	- 7
ζ^3 Libræ	6	+2.95	- 4.5	-16 12.6	3 51.6	+ 6 43.6	-0.4629	0.5406	-0.0933	0	-66
ζ^4 Libræ	6	2.96	4.3	16 27.4	4 57.4	+ 7 47.3	-0.2914	0.5408	0.0920	+ 9	-53
θ Libræ	4½	2.90	2.6	16 23.1	15 6.6	- 6 22.6	-1.2303	0.5444	0.0779	-58	-90
ν^2 Scorpii	4	2.93	0.4	19 9.3	23 46.7	+ 2 0.9	+1.2100	0.5476	0.0647	+71	+48
ν^1 Scorpii	6	2.93	- 0.4	19 8.8	23 46.8	+ 2 1.0	+1.2009	0.5476	0.0647	+71	+47
χ Ophiuchi	6	+2.85	+ 0.5	-18 11.4	26 6 57.8	+ 8 58.1	-0.2808	0.5499	-0.0538	+ 5	-53
B. A. C. 5580	6½	2.86	2.0	19 42.0	13 57.2	- 8 16.1	+1.0447	0.5520	0.0426	+71	+29
29 Ophiuchi	6	2.79	3.6	18 42.5	23 20.6	+ 0 48.8	-0.3712	0.5546	-0.0274	- 3	-69
				NEW	*MOON.*						
β Capricorni	3	+2.60	+16.7	-15 8.6	30 18 57.5	- 6 38.7	+0.4615	0.5584	+0.1237	+57	-10
B. A. C. 7087	6	2.60	17.5	14 7.1	31 1 4.5	- 0 43.8	+0.1541	0.5578	0.1320	+37	-27
8 Aquarii	6	2.65	18.5	13 29.9	13 2.4	+10 50.2	+1.1641	0.5559	0.1468	+77	+39
ν Aquarii	4½	2.65	19.2	11 50.3	17 34.0	- 8 47.2	+0.0845	0.5552	0.1522	+35	-31
17 Aquarii	6	+2.67	+19.8	- 9 48.8	23 50.2	- 2 43.4	-1.0894	0.5551	+0.1546	-35	-90

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1883.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington		Angle from		Washington		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 1	62 Virginis	6½	9 51	15 5	27	68	Star 0′.3	north of	☽'s	limb.	
4	λ Libræ	6	12 2	17 3	136	177	13 7	18 8	257	289	1 5
	NEW MOON.										
13	22 Piscium	6½	5 10	9 37	94	43	6 1	10 28	223	172	0 51
15	π Piscium	5½	3 32	7 52	1	322	4 0	8 19	318	274	0 27
15	B. A. C. 490	7½	3 29	7 49	38	359	4 32	8 52	284	237	1 3
23	α Cancri *	4	1 52	5 40	11	60	Star 2′.0	north of	☽'s	limb.	
23	κ Cancri	5	7 19	11 7	182	217	7 52	11 40	225	251	0 33
24	14 Sextantis	6	14 49	18 31	110	59	15 50	19 32	294	243	1 1
25	36 Sextantis	6	8 50	12 30	116	147	10 19	13 58	301	308	1 28
Feb. 2	ξ Ophiuchi	5	13 56	17 3	86	124	15 14	18 21	287	312	1 18
	NEW MOON.										
16	71 Orionis	6	8 38	10 51	134	84	9 41	11 54	250	195	1 3
18	1 Cancri	6	5 4	7 9	42	92	5 44	7 50	344	28	0 40
19	A^2 Cancri	6	5 27	7 29	196	245	Star 4′.2	south of	☽'s	limb.	
19	60 Cancri	6	11 7	13 8	92	50	12 16	14 17	317	267	1 10
22	p^5 Leonis	5½	8 56	10 45	126	160	10 22	12 11	294	308	1 27
28	β^1 Scorpii	2	14 48	16 13	54	70	15 50	17 15	330	332	1 2
28	β^2 Scorpii	5½	14 49	16 13	54	70	15 50	17 15	331	333	1 2
	NEW MOON.										
Mar. 18	A^2 Cancri	6	15 11	15 25	18	327	Star 1′.9	north of	☽'s	limb.	
19	ω Leonis	5½	10 53	11 4	95	64	12 8	12 18	319	275	1 15
23	χ Virginis	5	16 56	16 50	111	64	18 2	17 56	284	234	1 6
24	56 Virginis	6½	9 0	8 51	89	134	10 7	9 58	324	2	1 7
24	58 Virginis	6	11 21	11 12	28	54	Star 0′.4	north of	☽'s	limb.	
31	ρ^1 Sagittarii	4	15 39	15 1	13	53	16 3	15 25	336	13	0 24
31	ρ^2 Sagittarii	5½	15 26	14 49	137	179	16 12	15 34	211	247	0 45
Apr. 1	β Capricorni	3	18 25	17 43	359	23	18 47	18 5	327	347	0 22
	NEW MOON.										
11	127 Tauri ‡	6½	12 22	11 2	132	82	13 3	11 43	241	195	0 41
15	κ Cancri	5	6 48	5 13	107	148	8 16	6 41	300	320	1 28
16	14 Sextantis	6	15 24	13 44	80	29	16 15	14 35	322	271	0 51
17	36 Sextantis	6	9 57	8 13	98	112	11 20	9 37	322	308	1 24
20	50 Virginis	6	16 57	15 1	75	31	17 57	16 1	318	269	1 0
24	ψ Ophiuchi	5	15 31	13 20	65	75	16 51	14 39	309	301	1 19
26	16 Sagittarii	6	19 28	17 7	170	153	Star 3′.9	south of	☽'s	limb.	
30	B. A. C. 7562 †	6½	15 59	13 24	92	143	16 58	14 22	236	284	0 59
30	c^1 Capricorni †	5	16 2	13 26	102	153	16 57	14 21	225	273	0 54
May 1	κ Aquarii *	5	16 4	13 24	22	73	16 39	13 59	302	353	0 35
	NEW MOON.										
20	26 Libræ	6	15 16	11 23	16	14	Star 1′.3	north of	☽'s	limb.	
20	28 Libræ	6½	19 13	15 19	63	20	20 12	16 18	306	257	0 59
21	β^1 Scorpii	2	14 30	10 32	113	133	15 59	12 1	271	271	1 29
21	β^2 Scorpii	5½	14 30	10 32	113	133	15 59	12 1	271	271	1 30

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1883.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington		Angle from		Washington		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
	NEW MOON.										
June 9	ω Leonis	5½	13 18	8 6	21	329	Star 2′.9	north of	☽'s	limb.	
13	χ Virginis *	5	18 17	12 49	133	82	19 10	13 41	258	206	0 53
14	58 Virginis	6	12 59	7 28	27	27	Star 1′.5	north of	☽'s	limb.	
14	62 Virginis	6½	15 25	9 53	141	111	16 35	11 3	259	219	1 10
14	α Virginis	1	18 46	13 13	13	323	Star 6′.2	north of	☽'s	limb.	
17	47 Libræ ‡	6½	20 25	14 40	93	46	21 29	15 44	269	218	1 4
21	ρ¹ Sagittarii	4	15 11	9 11	355	39	Star 0′.9	north of	☽'s	limb.	
21	ρ² Sagittarii	5½	14 46	8 46	129	175	15 36	9 36	221	261	0 50
22	β Capricorni	3	18 17	12 13	345	11	Star 5′.2	north of	☽'s	limb.	
26	25 Piscium	6	17 44	11 24	69	120	18 41	12 21	249	299	0 58
27	60 Piscium †	6½	18 7	11 43	78	129	19 0	12 36	241	292	0 53
29	ο Arietis	6	20 58	14 25	342	35	Star 3′.5	north of	☽'s	limb.	
July 1	B. A. C. 1468	6	21 54	15 14	171	221	Star 0′.9	south of	☽'s	limb.	
	NEW MOON.										
6	κ Cancri ‡	5	15 22	8 23	44	353	15 45	8 46	353	303	0 23
8	36 Sextantis	6	15 31	8 24	96	46	16 31	9 24	307	256	1 0
15	ψ Ophiuchi	5	19 33	11 58	98	60	20 44	13 10	260	214	1 11
21	B. A. C. 7562 *	6½	15 42	7 44	4	55	16 1	8 3	326	17	0 19
21	c¹ Capricorni †	5	15 34	7 36	24	76	16 10	8 12	306	356	0 36
21	c² Capricorni	6	15 52	7 54	88	139	16 50	8 52	240	288	0 58
	NEW MOON.										
Aug. 5	p⁵ Leonis	5½	16 28	7 31	136	85	17 23	8 26	265	215	0 55
18	κ Aquarii ‡	5	3 53	18 4	14	324	4 25	18 35	304	253	0 32
25	m Tauri †	5½	21 54	11 38	134	182	22 26	12 10	211	261	0 32
29	60 Cancri †	6	1 48	15 15	114	162	2 43	16 10	267	319	0 55
	NEW MOON.										
Sept. 4	58 Virginis*	6	19 5	8 10	194	143	Star 1′.7	south of	☽'s	limb.	
6	α¹ Libræ	6	18 10	7 7	29	350	18 35	7 32	350	308	0 25
6	α² Libræ	2½	18 8	7 5	46	7	18 54	7 51	332	287	0 46
13	ν Aquarii	4½	0 54	13 23	26	343	1 41	14 10	290	243	0 47
16	21 Piscium	6	19 52	8 9	128	174	20 23	8 41	184	227	0 31
16	25 Piscium	6	22 39	10 56	347	7	22 58	11 15	318	335	0 19
17	ε Piscium	4	5 3	17 15	90	40	6 0	18 12	234	182	0 57
18	54 Ceti	6	23 0	10 49	104	148	23 59	11 48	208	242	0 49
18	B. A. C. 609	6	4 12	16 20	12	330	4 48	16 56	312	359	0 36
19	σ Arietis	5½	23 30	11 35	14	64	0 9	12 14	305	352	0 39
21	B. A. C. 1468 *	6	21 28	9 25	349	37	Star 3′.9	north of	☽'s	limb.	
21	ι Tauri	5½	23 16	11 13	11	65	23 37	11 34	328	23	0 21
25	A¹ Cancri	6	3 24	15 5	40	93	3 56	15 37	342	35	0 32
25	A² Cancri	6	5 28	17 8	132	181	6 41	18 21	261	300	1 14
26	ω Leonis *	5½	1 28	13 5	131	174	2 7	13 44	253	301	0 39
	NEW MOON.										
Oct. 2	86 Virginis	6	17 40	4 55	146	192	18 33	5 48	243	195	0 53
5	ν² Scorpii	4	18 33	5 36	184	153	Star 2′.2	south of	☽'s	limb.	
5	ν¹ Scorpii	6	18 33	5 36	184	153	Star 1′.7	south of	☽'s	limb.	
12	κ Aquarii ‡	5	4 8	14 42	37	346	4 53	15 27	283	232	0 45
18	δ³ Tauri	5	22 59	9 10	113	167	23 47	9 58	222	277	0 48

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1883.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington		Angle from		Washington		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
	NEW MOON.										
Oct. 19	119 Tauri	5	1 19	11 25	136	191	2 0	12 7	211	265	0 42
19	120 Tauri	6	2 18	12 24	174	227	Star 1′.5	south of	☽'s	limb.	
19	127 Tauri	6½	7 8	17 14	63	23	8 12	18 18	309	259	1 4
20	20 Geminorum	6½	1 45	11 48	170	225	1 55	11 58	188	243	0 10
20	26 Geminorum	5½	7 17	17 19	151	130	8 11	18 13	232	192	0 54
21	68 Geminorum	5½	4 11	14 10	187	238	Star 0′.3	south of	☽'s	limb.	
24	16 Sextantis	6	5 22	15 8	85	136	6 6	15 52	313	2	0 44
	NEW MOON.										
Nov. 6	β Capricorni	3	23 9	8 5	103	68	0 8	9 4	215	172	0 59
7	ν Aquarii	4½	21 54	6 47	336	323	Star 1′.2	north of	☽'s	limb.	
10	21 Piscium	6	21 21	6 1	153	189	Star 3′.8	south of	☽'s	limb.	
11	60 Piscium	6½	23 3	7 40	334	4	Star 1′.9	north of	☽'s	limb.	
12	54 Ceti	6	0 53	9 25	125	145	1 33	10 5	188	193	0 41
13	σ Arietis	5½	0 38	9 7	21	64	1 26	9 55	299	336	0 48
15	*i* Tauri	5½	22 1	6 22	351	41	Star 8′.8	north of	☽'s	limb.	
15	*m* Tauri	5½	5 7	13 27	156	153	5 37	13 57	200	181	0 30
17	λ Geminorum	4	9 13	17 25	125	81	10 22	18 34	268	216	1 9
19	60 Cancri	6	2 2	10 6	81	131	2 55	11 0	300	352	0 54
19	κ Cancri	5	8 56	17 0	112	114	10 21	18 25	334	304	1 25
	NEW MOON.										
Dec. 5	B. A. C. 7562	6½	21 29	4 31	32	34	22 41	5 43	275	260	1 12
5	c^1 Capricorni	5	21 25	4 27	43	47	22 44	5 47	264	248	1 19
5	c^2 Capricorni	6	22 16	5 19	123	114	22 58	6 0	183	164	0 42
11	B. A. C. 1119	6	9 58	16 35	176	125	Star 5′.2	south of	☽'s	limb.	
12	δ^3 Tauri	5	1 26	8 0	168	220	Star 1′.5	south of	☽'s	limb.	
12	B. A. C. 1468	6	10 16	16 50	43	349	10 52	17 25	320	268	0 35
13	119 Tauri	5	3 1	9 31	175	225	Star 4′.1	south of	☽'s	limb.	
13	127 Tauri	6½	8 19	14 49	69	17	9 19	15 48	305	250	1 0
14	26 Geminorum	5½	7 22	13 47	190	167	Star 3′.6	south of	☽'s	limb.	
15	68 Geminorum	5½	2 25	8 47	184	130	Star 5′.6	south of	☽'s	limb.	
16	A^1 Cancri	6	9 6	15 24	65	52	10 1	16 19	340	308	0 55
16	A^2 Cancri	6	11 29	17 46	102	55	12 36	18 53	302	250	1 7
24	ν^1 Libræ *	6	8 19	14 5	75	128	9 8	14 54	318	10	0 50
24	ν^2 Libræ †	6½	8 29	14 14	126	178	9 24	15 10	269	320	0 56

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

FOR WASHINGTON MEAN NOON.

Date.	k	i	θ	L	Date.	k	i	θ	L
Jan. 1	0.962	22°.5	4°.5	33.5	July 0	0.332	109°.6	166°.0	35.7
6	0.921	32.6	357.7	40.1	5	0.462	94.4	170.4	44.9
11	0.851	45.5	351.8	49.7	10	0.609	77.4	175.7	54.7
16	0.732	62.6	346.6	60.4	15	0.764	58.1	182.3	63.9
21	0.580	84.8	341.9	66.2	20	0.898	37.2	190.9	68.3
26	0.314	112.5	336.7	56.3	25	0.979	16.9	206.9	65.0
31	0.097	143.7	327.3	21.6	30	0.998	5.4	311.1	56.0
Feb. 5	0.009	169.2	261.4	1.9	Aug. 4	0.975	18.4	2.3	46.6
10	0.068	149.8	183.4	13.2	9	0.932	30.2	12.4	39.2
15	0.203	126.4	173.4	29.7	14	0.884	39.8	17.5	34.2
20	0.342	108.4	169.1	36.5	19	0.835	47.9	21.0	31.2
25	0.459	94.7	165.8	36.5	24	0.786	55.1	23.4	29.7
Mar. 2	0.552	84.0	162.6	34.3	29	0.734	63.2	25.1	29.3
7	0.627	75.3	159.6	32.1	Sept. 3	0.677	69.3	26.4	30.0
12	0.690	67.7	156.8	30.8	8	0.610	77.2	27.5	31.6
17	0.744	60.7	154.1	30.2	13	0.530	86.6	28.4	33.7
22	0.796	53.7	151.8	30.7	18	0.429	98.2	29.6	35.2
27	0.845	46.4	149.7	32.6	23	0.307	113.0	31.4	33.9
Apr. 1	0.894	38.0	147.9	36.1	28	0.162	132.6	34.8	24.9
6	0.942	27.9	146.3	41.7	Oct. 3	0.037	157.7	44.8	7.5
11	0.982	15.5	143.1	49.6	8	0.010	169.0	181.0	2.3
16	1.000	2.5	43.2	59.3	13	0.139	136.1	204.3	28.3
21	0.970	19.9	338.0	67.3	18	0.367	105.3	207.8	57.1
26	0.877	41.0	337.9	69.0	23	0.603	78.1	209.1	64.8
May 1	0.737	61.8	340.1	63.0	28	0.773	56.9	209.3	57.2
6	0.584	80.4	343.0	53.4	Nov. 2	0.878	40.9	208.5	46.9
11	0.440	96.9	346.0	43.5	7	0.939	28.6	206.8	37.8
16	0.315	111.7	348.8	34.5	12	0.973	18.8	203.9	31.7
21	0.205	126.1	351.5	25.6	17	0.991	11.0	198.9	27.8
26	0.114	140.6	354.8	11.6	22	0.999	4.4	185.3	25.4
31	0.044	155.7	0.8	7.0	27	1.000	2.4	55.0	24.4
June 5	0.007	170.1	27.5	1.2	Dec. 2	0.995	8.0	26.7	24.5
10	0.010	168.9	131.5	1.6	7	0.985	14.2	18.6	25.6
15	0.052	153.6	151.7	8.1	12	0.967	20.9	12.6	28.1
20	0.125	138.6	158.0	17.3	17	0.938	28.8	7.1	32.1
25	0.220	124.0	162.2	26.7	22	0.891	38.4	1.8	38.4
30	0.332	109.6	166.0	35.7	27	0.816	50.8	356.9	47.1
					32	0.694	67.2	352.1	57.2

NOTATION.

k, the ratio of the illuminated portion of the apparent disk to the entire apparent disk considered as the superficies of a circle.

i, the angle between the sun and earth, as seen from the planet.

θ, the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L, the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

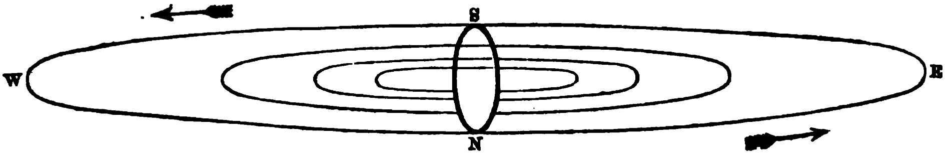
Date.	*k*	*i*	*θ*	*L*	Date.	*k*	*i*	*θ*	*L*
Jan. 1	0.175	130°.5	196°.0	201.1	July 0	0.924	31°.9	172°.2	53.5
6	0.222	123.9	194.9	214.9	5	0.933	29.9	175.1	52.7
11	0.265	118.0	193.6	218.2	10	0.941	28.0	178.2	51.9
16	0.306	112.9	192.0	214.4	15	0.949	26.0	181.4	51.2
21	0.344	108.2	190.2	206.9	20	0.956	24.1	184.6	50.6
26	0.380	103.9	188.2	197.3	25	0.963	22.1	188.0	50.1
31	0.412	100.1	186.0	186.2	30	0.969	20.1	191.3	49.6
Feb. 5	0.443	96.6	183.7	175.0	Aug. 4	0.975	18.2	194.6	49.2
10	0.471	93.3	181.4	164.3	9	0.980	16.3	198.0	48.9
15	0.499	90.2	178.9	154.4	14	0.984	14.4	201.4	48.6
20	0.524	87.2	176.4	144.8	19	0.988	12.4	204.9	48.4
25	0.548	84.4	174.0	136.1	24	0.992	10.5	208.5	48.2
Mar. 2	0.572	81.8	171.5	128.0	29	0.994	8.6	212.7	48.0
7	0.593	79.3	169.1	120.7	Sept. 3	0.996	6.8	218.3	47.8
12	0.614	76.9	166.8	114.1	8	0.998	5.1	225.3	47.6
17	0.633	74.5	164.7	108.0	13	0.999	3.4	239.1	47.5
22	0.653	72.2	162.7	102.5	18	1.000	2.3	270.4	47.5
27	0.672	69.9	160.8	97.3	23	1.000	2.4	319.7	47.4
Apr. 1	0.689	67.7	159.3	92.5	28	0.999	3.4	351.3	47.3
6	0.706	65.6	157.8	88.3	Oct. 3	0.998	4.9	3.3	47.4
11	0.723	63.5	156.7	84.4	8	0.997	6.7	8.9	47.5
16	0.739	61.4	155.8	80.9	13	0.995	8.5	12.1	47.6
21	0.754	59.4	155.1	77.6	18	0.992	10.2	13.8	47.8
26	0.769	57.4	154.6	74.6	23	0.989	11.9	14.5	48.1
May 1	0.784	55.4	154.4	72.0	28	0.986	13.6	14.6	48.3
6	0.798	53.4	154.5	69.6	Nov. 2	0.982	15.3	14.0	48.6
11	0.811	51.5	154.8	67.4	7	0.978	16.9	13.0	49.0
16	0.825	49.5	155.4	65.4	12	0.974	18.6	11.6	49.5
21	0.837	47.5	156.3	63.6	17	0.969	20.3	10.0	50.0
26	0.850	45.5	157.5	61.8	22	0.964	22.0	8.0	50.5
31	0.862	43.6	158.9	60.2	27	0.958	23.6	5.9	51.0
June 5	0.873	41.7	160.5	58.8	Dec. 2	0.952	25.2	3.5	51.6
10	0.884	39.8	162.4	57.5	7	0.946	26.9	1.1	52.3
15	0.895	37.8	164.5	56.3	12	0.939	28.5	358.6	53.1
20	0.905	35.9	166.8	55.3	17	0.932	30.2	356.1	54.0
25	0.915	33.9	169.4	54.4	22	0.925	31.9	353.7	54.9
30	0.924	31.9	172.2	53.5	27	0.917	33.6	351.3	55.9
					32	0.909	35.3	349.1	57.0

The satellites of Mars can not be observed during the year 1883.

THE APPARENT DISK OF MARS.

1883,	January	1	0.998
		31	0.994
	March	2	0.985
	April	1	0.973
	May	1	0.960
		31	0.946
	June	30	0.930
	July	30	0.915
	August	29	0.901
	September	28	0.890
	October	28	0.887
	November	27	0.904
	December	27	0.950

The numbers which represent the apparent disk are the versed sines of the illuminated portion divided by the apparent diameter, or the ratio of the apparent illuminated disk to the entire disk.



APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1883, AS SEEN IN AN INVERTING TELESCOPE.

(The vertical scale is three times the horizontal one.)

The object of this figure is to facilitate the identification of the satellites in cases where the diagrams of configurations do not suffice for that purpose: reference to the above diagram enables one to identify the inner and outer satellite of the pair. The central ellipse represents the disk of Jupiter, elongated three times in the vertical direction to correspond to the representation of the orbits of the satellites.

Facing each page of the phenomena of Jupiter's satellites, pages 442—460, is the page of diagrams of configurations, for the same month. The vertical row of light disks ○ in the middle of the page represents the relative position of Jupiter each day. The dots adjacent in the same horizontal space represent the positions of the several satellites on the same day, at the hour and minute of Washington mean time indicated above the diagrams. The latitudes of the satellites are always considered zero in constructing the diagrams, except where two or more satellites chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. The numerals designating the satellites are placed on the right or left hand side of the dot, according as the motion of the satellite, for the time of the configuration, is toward the east or toward the west—the motion being always toward the numeral. Frequently, at the epoch of the configuration, one or more satellites will be invisible, being projected on the disk of the planet: this phenomenon is indicated by a light disk ○ at the left hand side of the page. Frequently, also, one or more satellites will be invisible, being concealed in occultation behind the disk, or eclipsed in the shadow of the planet: this phenomenon is indicated by a dark disk ● at the right hand side of the page. In both cases, the annexed numeral serves to point out which satellite is thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the motion of the satellite during the interval may be judged by transferring its given position to the above diagram, and estimating its motion during the elapsed interval on the above diagram of the orbits, by means of the following table of the periods:—

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d
I.	1	18	28	35.945	=	1.76986048
II.	3	13	17	53.735	=	3.55409416
III.	7	3	59	35.854	=	7.16638720
IV.	16	18	5	6.928	=	16.75355241

WASHINGTON MEAN TIMES OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE I.

		h m			h m			h m			h m
Jan.	0	14 51.7	Mar.	19	11 5.6	Aug.	1	1 15.9	Oct.	17	22 53.8
	2	9 17.8		21	5 34.6		2	19 46.1		19	17 22.2
	4	3 44.1		23	0 3.9		4	14 16.2		21	11 50.7
	5	22 10.3		24	18 33.2		6	8 46.3		23	6 19.1
	7	16 36.6		26	13 2.6		8	3 16.5		25	0 47.5
	9	11 2.8		28	7 32.0		9	21 46.5		26	19 15.7
	11	5 29.2		30	2 1.5		11	16 16.6		28	13 43.9
	12	23 55.4		31	20 30.8		13	10 46.6		30	8 12.0
	14	18 22.0	Apr.	2	15 0.4		15	5 16.7	Nov.	1	2 40.1
	16	12 48.5		4	9 30.0		16	23 46.7		2	21 8.0
	18	7 15.2		6	3 59.7		18	18 16.7		4	15 36.0
	20	1 41.8		7	22 29.2		20	12 46.6		6	10 3.9
	21	20 8.6		9	16 59.0		22	7 16.5		8	4 31.7
	23	14 35.4		11	11 28.6		24	1 46.4		9	22 59.4
	25	9 2.4		13	5 58.5		25	20 16.3		11	17 27.1
	27	3 29.3		15	0 28.3		27	14 46.2		13	11 54.7
	28	21 56.5		16	18 58.3		29	9 15.9		15	6 22.3
	30	16 23.6		18	13 28.1		31	3 45.6		17	0 49.7
Feb.	1	10 50.8		20	7 58.2	Sept.	1	22 15.3		18	19 17.1
	3	5 18.1		22	2 28.1		3	16 45.0		20	13 44.4
	4	23 45.6		23	20 58.1		5	11 14.6		22	8 11.6
	6	18 13.0		25	15 28.1		7	5 44.2		24	2 38.8
	8	12 40.7		27	9 58.3		9	0 13.7		25	21 5.9
	10	7 8.2		29	4 28.3		10	18 43.4		27	15 32.9
	12	1 36.0		30	22 58.4		12	13 12.9		29	9 59.8
	13	20 3.8	May	2	17 28.6		14	7 42.5	Dec.	1	4 26.8
	15	14 31.6		4	11 58.8		16	2 11.9		2	22 53.6
	17	8 59.5		6	6 28.8		17	20 41.3		4	17 20.3
	19	3 27.6		8	0 59.0		19	15 10.6		6	11 47.1
	20	21 55.6		9	19 29.2		21	9 39.9		8	6 13.7
	22	16 23.7		11	13 59.5		23	4 9.3		10	0 40.3
	24	10 51.9		13	8 29.6		24	22 38.5		11	19 6.9
	26	5 20.3		15	3 0.0		26	17 7.6		13	13 33.3
	27	23 48.6		16	21 30.4		28	11 36.7		15	7 59.7
Mar.	1	18 17.1		18	16 0.7		30	6 5.8		17	2 26.0
	3	12 45.6		20	10 31.0	Oct.	2	0 34.9		18	20 52.3
	5	7 14.3		22	5 1.4		3	19 3.9		20	15 18.5
	7	1 43.0		23	23 31.7		5	13 32.8		22	9 44.7
	8	20 11.8		25	18 2.1		7	8 1.7		24	4 10.8
	10	14 40.6		27	12 32.5		9	2 30.5		25	22 37.0
	12	9 9.4		29	7 2.8		10	20 59.2		27	17 3.0
	14	3 38.3		31	1 33.2		12	15 27.9		29	11 29.0
	15	22 7.4					14	9 56.6		31	5 54.9
	17	16 36.4					16	4 25.2			

WASHINGTON MEAN TIMES OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE II.

		h m			h m			h m			h m
Jan.	1	4 59.6	Mar.	20	7 39.2	July	29	23 2.9	Oct.	16	5 29.9
	4	18 7.0		23	20 58.0	Aug.	2	12 27.5		19	18 48.6
	8	7 14.9		27	10 17.3		6	1 52.8		23	8 7.8
	11	20 23.0		30	23 36.8		9	15 17.4		26	21 25.5
	15	9 31.5	Apr.	3	12 56.9		13	4 42.6		30	10 43.6
	18	22 40.5		7	2 17.2		16	18 6.7	Nov.	3	0 0.3
	22	11 50.0		10	15 38.0		20	7 31.6		6	13 17.4
	26	1 0.0		14	4 59.1		23	20 55.6		10	2 32.9
	29	14 10.6		17	18 20.6		27	10 20.2		13	15 48.9
Feb.	2	3 21.8		21	7 42.4		30	23 43.6		17	5 3.1
	5	16 33.6		24	21 4.5	Sept.	3	13 7.9		20	18 17.8
	9	5 45.9		28	10 26.9		7	2 30.9		24	7 30.8
	12	18 58.9	May	1	23 49.5		10	15 54.8		27	20 44.3
	16	8 12.4		5	13 12.4		14	5 17.3	Dec.	1	9 56.1
	19	21 26.6		9	2 35.5		17	18 40.5		4	23 8.3
	23	10 41.3		12	15 58.8		21	8 2.4		8	12 19.1
	26	23 56.5		16	5 22.3		24	21 25.0		12	1 30.1
Mar.	2	13 12.4		19	18 46.0		28	10 46.3		15	14 39.7
	6	2 28.7		23	8 9.8	Oct.	2	0 8.3		19	3 49.6
	9	15 45.6		26	21 33.9		5	13 28.8		22	16 58.3
	13	5 3.0		30	10 58.0		9	2 49.9		26	6 7.2
	16	18 20.9					12	16 9.6		29	19 14.9

SATELLITE III.

		h m			h m			h m			h m
Jan.	4	3 31.2	Mar.	23	20 15.5	July	31	3 22.0	Oct.	18	2 33.9
	11	6 51.2		31	0 24.7	Aug.	7	7 48.2		25	6 34.2
	18	10 14.5	Apr.	7	4 36.6		14	12 13.7	Nov.	1	10 30.4
	25	13 42.0		14	8 51.9		21	16 37.9		8	14 21.8
Feb.	1	17 14.3		21	13 9.3		28	21 1.2		15	18 8.5
	8	20 52.1		28	17 28.9	Sept.	5	1 22.1		22	21 50.8
	16	0 34.4	May	5	21 50.6		12	5 41.0		30	1 28.3
	23	4 21.9		13	2 14.2		19	9 57.2	Dec.	7	5 1.9
Mar.	2	8 13.8		20	6 39.9		26	14 10.7		14	8 30.4
	9	12 10.1		26	11 6.3	Oct.	3	18 21.5		21	11 54.9
	16	16 10.8					10	22 29.1		28	15 15.3

SATELLITE IV.

		h m			h m			h m			h m
Jan.	10	4 35.3	Apr.	3	17 10.3	July	30	16 9.1	Oct.	22	18 48.2
	26	19 32.0		20	12 40.1	Aug.	16	12 44.5	Nov.	8	12 31.2
Feb.	12	11 26.5	May	7	8 42.0	Sept.	2	9 1.8		25	5 15.3
Mar.	1	4 24.1		24	5 6.1		19	4 53.9	Dec.	11	20 57.8
	17	22 22.0				Oct.	6	0 12.7		28	11 45.8

WASHINGTON MEAN TIME.

JANUARY.

d	h	m	s			
1	3	38		II.	Oc.	Dis.
	7	4	4.8	II. *	Ec.	Re.
	11	3		I. *	Tr.	In.
	11	25		I. *	Sh.	In.
	13	18		I. *	Tr.	Eg.
	13	41		I. *	Sh.	Eg.
2	8	10		I. *	Oc.	Dis.
	10	47	43.2	I. *	Ec.	Re.
	21	46		II.	Tr.	In.
	22	36		II.	Sh.	In.
3	0	30		II.	Tr.	Eg.
	1	20		II.	Sh.	Eg.
	5	29		I. *	Tr.	In.
	5	54		I. *	Sh.	In.
	7	44		I. *	Tr.	Eg.
	8	10		I. *	Sh.	Eg.
4	2	13		III.	Oc.	Dis.
	2	36		I.	Oc.	Dis.
	5	16	32.1	I.	Ec.	Re.
	6	36	29.0	III.*	Ec.	Re.
	16	45		II. *	Oc.	Dis.
	20	21	47.6	II.	Ec.	Re.
	23	55		I.	Tr.	In.
5	0	22		I.	Sh.	In.
	2	10		I.	Tr.	Eg.
	2	38		I.	Sh.	Eg.
	21	2		I.	Oc.	Dis.
	23	45	15.6	I.	Ec.	Re.
6	10	55		II. *	Tr.	In.
	11	55		II. *	Sh.	In.
	13	39		II. *	Tr.	Eg.
	14	39		II. *	Sh.	Eg.
	18	21		I.	Tr.	In.
	18	51		I.	Sh.	In.
	20	36		I.	Tr.	Eg.
	21	7		I.	Sh.	Eg.
7	15	29		I. *	Oc.	Dis.
	16	0		III.*	Tr.	In.
	18	6		III.	Sh.	In.
	18	14	6.9	I.	Ec.	Re.
	18	38		III.	Tr.	Eg.
	20	50		III.	Sh.	Eg.
8	5	53		II. *	Oc.	Dis.
	9	39	34.0	II. *	Ec.	Re.
	12	47		I. *	Tr.	In.
	13	19		I. *	Sh.	In.
	15	2		I. *	Tr.	Eg.
	15	35		I. *	Sh.	Eg.
9	9	55		I. *	Oc.	Dis.
	12	42	52.5	I. *	Ec.	Re.
10	0	4		II.	Tr.	In.
	1	13		II.	Sh.	In.
	2	48		II.	Tr.	Eg.
	3	58		II.	Sh.	Eg.
	7	13		I. *	Tr.	In.
	7	48		I. *	Sh.	In.
	9	29		I. *	Tr.	Eg.
	10	4		I. *	Sh.	Eg.
11	4	21		I.	Oc.	Dis.
	5	32		III.*	Oc.	Dis.
	7	11	43.5	I. *	Ec.	Re.
	10	37	37.5	III.*	Ec.	Re.
	19	1		II.	Oc.	Dis.
11	22	57	17.1	II.	Ec.	Re.
12	1	40		I.	Tr.	In.
	2	17		I.	Sh.	In.
	3	56		I.	Tr.	Eg.
	4	33		I.	Sh.	Eg.
	22	48		I.	Oc.	Dis.
13	1	40	28.9	I.	Ec.	Re.
	13	13		II. *	Tr.	In.
	14	32		II. *	Sh.	In.
	15	57		II. *	Tr.	Eg.
	17	17		II.	Sh.	Eg.
	20	6		I.	Tr.	In.
	20	45		I.	Sh.	In.
	22	22		I.	Tr.	Eg.
	23	2		I.	Sh.	Eg.
14	17	14		I.	Oc.	Dis.
	19	22		III.	Tr.	In.
	20	9	21.9	I.	Ec.	Re.
	22	0		III.	Tr.	Eg.
	22	7		III.	Sh.	In.
15	0	51		III.	Sh.	Eg.
	8	9		II. *	Oc.	Dis.
	12	15	2.6	II. *	Ec.	Re.
	14	32		I. *	Tr.	In.
	15	14		I. *	Sh.	In.
	16	48		I.	Tr.	Eg.
	17	30		I.	Sh.	Eg.
16	11	41		I. *	Oc.	Dis.
	14	38	8.8	I. *	Ec.	Re.
17	2	23		II.	Tr.	In.
	3	50		II.	Sh.	In.
	5	7		II.	Tr.	Eg.
	6	36		II. *	Sh.	Eg.
	8	59		I. *	Tr.	In.
	9	43		I. *	Sh.	In.
	11	14		I. *	Tr.	Eg.
	11	59		I. *	Sh.	Eg.
18	6	7		I. *	Oc.	Dis.
	8	55		III.*	Oc.	Dis.
	9	7	2.8	I. *	Ec.	Re.
	11	34		III.*	Oc.	Re.
	12	3	9.2	III.*	Ec.	Dis.
	14	38	44.4	III.*	Ec.	Re.
	21	18		II.	Oc.	Dis.
19	1	32	46.2	II.	Ec.	Re.
	3	25		I.	Tr.	In.
	4	12		I.	Sh.	In.
	5	41		I. *	Tr.	Eg.
	6	28		I. *	Sh.	Eg.
20	0	34		I.	Oc.	Dis.
	3	35	49.6	I.	Ec.	Re.
	15	33		II. *	Tr.	In.
	17	9		II.	Sh.	In.
	18	18		II.	Tr.	Eg.
	19	55		II.	Sh.	Eg.
	21	52		I.	Tr.	In.
	22	41		I.	Sh.	In.
21	0	8		I.	Tr.	Eg.
	0	56		I.	Sh.	Eg.
	19	1		I.	Oc.	Dis.
	22	4	44.8	I.	Ec.	Re.
	22	47		III.	Tr.	In.
22	1	26		III.	Tr.	Eg.
22	2	7		III.	Sh.	In.
	4	52		III.	Sh.	Eg.
	10	28		II. *	Oc.	Dis.
	14	50	30.3	II. *	Ec.	Re.
	16	19		I.	Tr.	In.
	17	9		I.	Sh.	In.
	18	35		I.	Tr.	Eg.
	19	25		I.	Sh.	Eg.
23	13	28		I. *	Oc.	Dis.
	16	33	34.3	I.	Ec.	Re.
24	4	44		II.	Tr.	In.
	6	28		II. *	Sh.	In.
	7	29		II. *	Tr.	Eg.
	9	14		II. *	Sh.	Eg.
	10	45		I. *	Tr.	In.
	11	38		I. *	Sh.	In.
	13	1		I. *	Tr.	Eg.
	13	54		I. *	Sh.	Eg.
25	7	55		I. *	Oc.	Dis.
	11	2	29.1	I. *	Ec.	Re.
	12	22		III.*	Oc.	Dis.
	15	2		III.*	Oc.	Re.
	16	3	11.4	III.	Ec.	Dis.
	18	40	2.0	III.	Ec.	Re.
	23	38		II.	Oc.	Dis.
26	4	8	14.2	II.	Ec.	Re.
	5	12		I.	Tr.	In.
	6	7		I. *	Sh.	In.
	7	28		I. *	Tr.	Eg.
	8	23		I. *	Sh.	Eg.
27	2	22		I.	Oc.	Dis.
	5	31	17.7	I.	Ec.	Re.
	17	55		II.	Tr.	In.
	19	47		II.	Sh.	In.
	20	40		II.	Tr.	Eg.
	22	33		II.	Sh.	Eg.
	23	39		I.	Tr.	In.
28	0	36		I.	Sh.	In.
	1	55		I.	Tr.	Eg.
	2	52		I.	Sh.	Eg.
	20	49		I.	Oc.	Dis.
29	0	0	14.3	I.	Ec.	Re.
	2	16		III.	Tr.	In.
	4	56		III.	Tr.	Eg.
	6	7		III.*	Sh.	In.
	8	54		III.*	Sh.	Eg.
	12	48		II. *	Oc.	Dis.
	17	25	57.5	II.	Ec.	Re.
	18	6		I.	Tr.	In.
	19	4		I.	Sh.	In.
	20	22		I.	Tr.	Eg.
	21	20		I.	Sh.	Eg.
30	15	16		I. *	Oc.	Dis.
	18	29	5.5	I.	Ec.	Re.
31	7	7		II. *	Tr.	In.
	9	6		II. *	Sh.	In.
	9	52		II. *	Tr.	Eg.
	11	52		II. *	Sh.	Eg.
	12	33		I. *	Tr.	In.
	13	33		I. *	Sh.	In.
	14	50		I. *	Tr.	Eg.
	15	49		I.	Sh.	Eg.

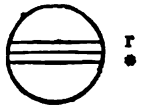
NOTE—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit ofthe shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

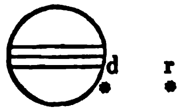
JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

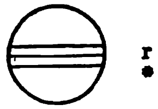
I.



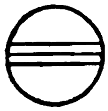
III.



II.



IV.



Not Eclipsed.

Configurations at 11ʰ for an Inverting Telescope.

Day.	West.		East.
1	O 1· 3·	O	4· ·2
2	·3 4·	O	·1 2·
3	4· 2 ·3 1·	O	
4	4· ·2	O	·3 ·1
5	4· 1·	O	·2 ·3
6	·4	2O·	1· 3·
7	·4 ·2 ·1	O	3·
8	·4 3·	O	1· ·2
9	3· ·4	O	2· ·1 ●
10	·3 2· 1·	⊙	·4
11	·2	O	·3 ·1 ·4
12	1·	O	·2 ·3 ·4
13		O	2· 1· 3· ·4
14	2· ·1	O	3· 4·
15	3·	O	1· 4· ·2 ●
16	3·	·O1	2· 4·
17	O 1· ·3 2·	O	4·
18	O 4· ·2	O	·1 ·3 ●
19	4· 1·	O	·2 ·3
20	4·	O	2· ·1 3·
21	4· 2· ·1	O	3·
22	4· 3·	O	1· ·2 ●
23	·4 3· ·1	O	2·
24	O 1· ·4 ·3 2·	O	
25	·4 ·2	·O3	·1 ●
26	1· ·4	O	·2 ·3
27		O	2· ·1 ·4 3·
28	2· 1·	O	3· ·4
29	3· ·2	O	1· ·4
30	3· ·1	O	·2 ·4
31	·3 2·	O1·	4·

WASHINGTON MEAN TIME.

FEBRUARY.

d	h	m	s				
1	9	43		I.	*	Oc.	Dis.
	12	58	2.1	I.	*	Ec.	Re.
	15	54		III.		Oc.	Dis.
	18	34		III.		Oc.	Re.
	20	3	26.8	III.		Ec.	Dis.
	22	41	32.6	III.		Ec.	Re.
2	1	59		II.		Oc.	Dis.
	6	43	41.3	II.	*	Ec.	Re.
	7	0		I.	*	Tr.	In.
	8	2		I.	*	Sh.	In.
	9	17		I.	*	Tr.	Eg.
	10	18		I.	*	Sh.	Eg.
3	4	10		I.		Oc.	Dis.
	7	26	52.0	I.	*	Ec.	Re.
	20	20		II.		Tr.	In.
	22	25		II.		Sh.	In.
	23	5		II.		Tr.	Eg.
4	1	11		II.		Sh.	Eg.
	1	28		I.		Tr.	In.
	2	30		I.		Sh.	In.
	3	44		I.		Tr.	Eg.
	4	46		I.		Sh.	Eg.
	22	38		I.		Oc.	Dis.
5	1	55	50.0	I.		Ec.	Re.
	5	50		III.		Tr.	In.
	8	31		III.	*	Tr.	Eg.
	10	7		III.	*	Sh.	In.
	12	55		III.	*	Sh.	Eg.
	15	11		II.		Oc.	Dis.
	19	55		I.		Tr.	In.
	20	1	23.8	II.		Ec.	Re.
	20	59		I.		Sh.	In.
	22	11		I.		Tr.	Eg.
	23	15		I.		Sh.	Eg.
6	17	5		I.		Oc.	Dis.
	20	24	42.3	I.		Ec.	Re.
7	9	33		II.	*	Tr.	In.
	11	44		II.	*	Sh.	In.
	12	19		II.	*	Tr.	Eg.
	14	22		I.	*	Tr.	In.
	14	30		II.	*	Sh.	Eg.
	15	28		I.		Sh.	In.
	16	38		I.		Tr.	Eg.
	17	44		I.		Sh.	Eg.
8	11	33		I.	*	Oc.	Dis.
	14	53	40.0	I.	*	Ec.	Re.
	19	31		III.		Oc.	Dis.
	22	13		III.		Oc.	Re.
9	0	4	24.5	III.		Ec.	Dis.
	2	43	45.3	III.		Ec.	Re.
	4	23		II.		Oc.	Dis.
	8	49		I.	*	Tr.	In.
	9	19	7.3	II.	*	Ec.	Re.
	9	56		I.	*	Sh.	In.
	11	5		I.	*	Tr.	Eg.
	12	13		I.	*	Sh.	Eg.
10	6	0		I.		Oc.	Dis.
	9	22	30.7	I.	*	Ec.	Re.
	22	47		II.		Tr.	In.
11	1	3		II.		Sh.	In.
	1	33		II.		Tr.	Eg.
	3	17		I.		Tr.	In.
	3	49		II.		Sh.	Eg.
	4	25		I.		Sh.	In.
	5	33		I.		Tr.	Eg.
	6	42		I.	*	Sh.	Eg.
12	0	28		I.		Oc.	Dis.
	3	51	29.8	I.		Ec.	Re.
	9	28		III.	*	Tr.	In.
	12	11		III.	*	Tr.	Eg.
	14	6		III.	*	Sh.	In.
	16	56		III.		Sh.	Eg.
	17	36		II.		Oc.	Dis.
	21	45		I.		Tr.	In.
	22	36	49.3	II.		Ec.	Re.
	22	54		I.		Sh.	In.
13	0	0		I.		Tr.	Eg.
	1	11		I.		Sh.	Eg.
	18	56		I.		Oc.	Dis.
	22	20	23.0	I.		Ec.	Re.
14	12	2		II.	*	Tr.	In.
	14	22		II.	*	Sh.	In.
	14	48		II.		Tr.	Eg.
	16	12		I.		Tr.	In.
	17	8		II.		Sh.	Eg.
	17	22		I.		Sh.	In.
	18	28		I.		Tr.	Eg.
	19	39		I.		Sh.	Eg.
15	13	24		I.		Oc.	Dis.
	16	49	21.7	I.		Ec.	Re.
	23	13		III.		Oc.	Dis.
16	1	56		III.		Oc.	Re.
	4	4	59.6	III.		Ec.	Dis.
	6	45	35.0	III.	*	Ec.	Re.
	6	50		II.	*	Oc.	Dis.
	10	40		I.	*	Tr.	In.
	11	51		I.	*	Sh.	In.
	11	54	32.3	II.	*	Ec.	Re.
	12	55		I.	*	Tr.	Eg.
	14	8		I.	*	Sh.	Eg.
17	7	52		I.	*	Oc.	Dis.
	11	18	13.5	I.	*	Ec.	Re.
18	1	17		II.		Tr.	In.
	3	41		II.		Sh.	In.
	4	3		II.		Tr.	Eg.
	5	8		I.		Tr.	In.
	6	20		I.	*	Sh.	In.
	6	27		II.	*	Sh.	Eg.
	7	23		I.	*	Tr.	Eg.
	8	37		I.	*	Sh.	Eg.
19	2	20		I.		Oc.	Dis.
	5	47	13.2	I.		Ec.	Re.
	13	12		III.	*	Tr.	In.
	15	55		III.		Tr.	Eg.
	18	6		III.		Sh.	In.
	20	4		II.		Oc.	Dis.
	20	57		III.		Sh.	Eg.
	23	36		I.		Tr.	In.
20	0	49		I.		Sh.	In.
	1	12	13.9	II.		Ec.	Re.
	1	51		I.		Tr.	Eg.
	3	6		I.		Sh.	Eg.
	20	48		I.		Oc.	Dis.
21	0	16	7.3	I.		Ec.	Re.
	14	33		II.		Tr.	In.
	17	0		II.		Sh.	In.
	17	19		II.		Tr.	Eg.
	18	4		I.		Tr.	In.
	19	18		I.		Sh.	In.
	19	46		II.		Sh.	Eg.
	20	19		I.		Tr.	Eg.
	21	35		I.		Sh.	Eg.
22	15	16		I.		Oc.	Dis.
	18	45	6.9	I.		Ec.	Re.
23	3	0		III.		Oc.	Dis.
	5	44		III.		Oc.	Re.
	8	5	53.6	III.	*	Ec.	Dis.
	9	19		II.	*	Oc.	Dis.
	10	47	43.2	III.	*	Ec.	Re.
	12	32		I.	*	Tr.	In.
	13	46		I.	*	Sh.	In.
	14	29	56.5	II.		Ec.	Re.
	14	47		I.		Tr.	Eg.
	16	3		I.		Sh.	Eg.
24	9	44		I.	*	Oc.	Dis.
	13	13	59.3	I.	*	Ec.	Re.
25	3	50		II.		Tr.	In.
	6	19		II.		Sh.	In.
	6	35		II.	*	Tr.	Eg.
	7	0		I.	*	Tr.	In.
	8	15		I.	*	Sh.	In.
	9	5		II.	*	Sh.	Eg.
	9	16		I.	*	Tr.	Eg.
	10	32		I.	*	Sh.	Eg.
26	4	12		I.		Oc.	Dis.
	7	42	59.5	I.	*	Ec.	Re.
	17	0		III.		Tr.	In.
	19	45		III.		Tr.	Eg.
	22	6		III.		Sh.	In.
	22	34		II.		Oc.	Dis.
27	0	58		III.		Sh.	Eg.
	1	28		I.		Tr.	In.
	2	44		I.		Sh.	In.
	3	44		I.		Tr.	Eg.
	3	47	37.8	II.		Ec.	Re.
	5	1		I.		Sh.	Eg.
	22	41		I.		Oc.	Dis.
28	2	11	54.0	I.		Ec.	Re.
	17	7		II.		Tr.	In.
	19	38		II.		Sh.	In.
	19	52		II.		Tr.	Eg.
	19	56		I.		Tr.	In.
	21	13		I.		Sh.	In.
	22	12		I.		Tr.	Eg.
	22	24		II.		Sh.	Eg.
	23	30		I.		Sh.	Eg.

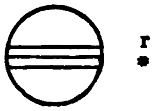
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

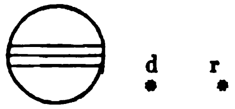
FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

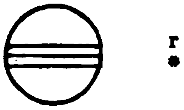
I.



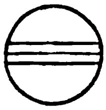
III.



II.



IV.



Not Eclipsed.

Configurations at 10ʰ 30ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·2 ·3	○	4· ·1 ●
2	1·	○	·2 ·3 4·
3		○	·1 4· 2 ·3
4	2· 1· 4·	○	3·
5	4· ·23·	○	1·
6	4· 3· ·1	○	·2
7	○ 2· 4· ·3	○	1·
8	·4 ·2 ·3 ·1	○	
9	○ 1· ·4	○	·2 ·3
10	·4	○	·1 2· ·3
11	·42· 1·	○	3·
12	○ 3· ·2	○4	·1
13	3· ·1	○	·2 ·4
14	·3	○	2· 1· ·4
15	2· ·3 ·1	○	·4
16	1	○	· ·3 ·4 ·2 ●
17		○	2· ·3 4· ·1 ●
18	2· 1·	○	3· 4·
19	·2	○	3· ·1 4·
20	3· 1·	○	4· ·2
21	·3 4·	○	2· 1·
22	4· 2· .3 ·1	○	
23	4·	○	1· ·2 ● ·3 ●
24	4·	○	2· ·3 ·1 ●
25	·4 2· 1·	○	3·
26	·4 ·2	○	3· ·1
27	·4 3· 1·	○	·2
28	3· ·4	○	2· 1·

WASHINGTON MEAN TIME.

MARCH.

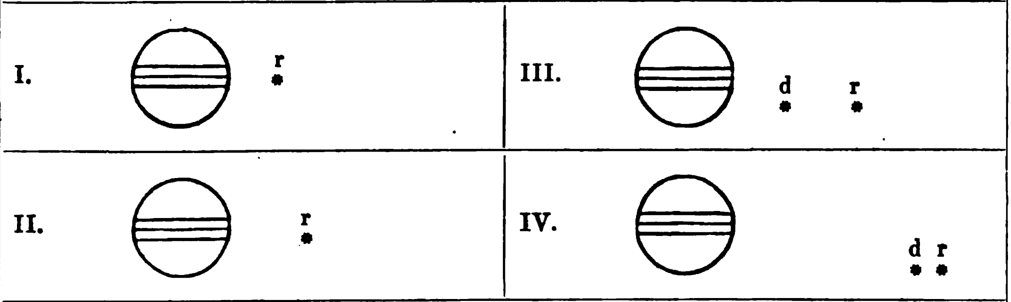
d	h	m	s			
1	17	9		I.	Oc.	Dis.
	20	40	54.2	I.	Ec.	Re.
2	6	51		III.*	Oc.	Dis.
	9	36		III.*	Oc.	Re.
	11	50		II. *	Oc.	Dis.
	12	6	14.8	III.*	Ec.	Dis.
	14	24		I.	Tr.	In.
	14	49	18.0	III.	Ec.	Re.
	15	42		I.	Sh.	In.
	16	40		I.	Tr.	Eg.
	17	5	20.0	II.	Ec.	Re.
	17	59		I.	Sh.	Eg.
3	11	38		I.	Oc.	Dis.
	15	9	46.9	I.	Ec.	Re.
4	6	25		II.	Tr.	In.
	8	53		I. *	Tr.	In.
	8	57		II. *	Sh.	In.
	9	10		II. *	Tr.	Eg.
	10	11		I. *	Sh.	In.
	11	9		I. *	Tr.	Eg.
	11	43		II. *	Sh.	Eg.
	12	28		I. *	Sh.	Eg.
5	6	6		I.	Oc.	Dis.
	9	38	47.4	I. *	Ec.	Re.
	20	54		III.	Tr.	In.
	23	40		III.	Tr.	Eg.
6	1	6		II.	Oc.	Dis.
	2	7		III.	Sh.	In.
	3	21		I.	Tr.	In.
	4	39		I.	Sh.	In.
	5	0		III.	Sh.	Eg.
	5	37		I.	Tr.	Eg.
	6	23	1.2	II.	Ec.	Re.
	6	56		I. *	Sh.	Eg.
7	0	35		I.	Oc.	Dis.
	4	7	42.2	I.	Ec.	Re.
	19	43		II.	Tr.	In.
	21	50		I.	Tr.	In.
	22	16		II.	Sh.	In.
	22	28		II.	Tr.	Eg.
	23	8		I.	Sh.	In.
8	0	6		I.	Tr.	Eg.
	1	2		II.	Sh.	Eg.
	1	25		I.	Sh.	Eg.
	19	4		I.	Oc.	Dis.
	22	36	42.6	I.	Ec.	Re.
9	10	47		III.*	Oc.	Dis.
	13	33		III.	Oc.	Re.
	14	23		II.	Oc.	Dis.
	16	6	29.5	III.	Ec.	Dis.
	16	18		I.	Tr.	In.
	17	37		I.	Sh.	In.
	18	34		I.	Tr.	Eg.
	18	50	45.7	III.	Ec.	Re.
	19	40	43.1	II.	Ec.	Re.
	19	54		I.	Sh.	Eg.
10	1	25		IV.	Sh.	In.
	2	25		IV.	Sh.	Eg.
	13	33		I.	Oc.	Dis.
	17	5	35.2	I.	Ec.	Re.
11	9	1		II. *	Tr.	In.
	10	47		I. *	Tr.	In.
	11	36		II. *	Sh.	In.
	11	47		II. *	Tr.	Eg.
	12	6		I. *	Sh.	In.
	13	3		I.	Tr.	Eg.
11	14	22		I.	Sh.	Eg.
	14	22		II.	Sh.	Eg.
12	8	1		I. *	Oc.	Dis.
	11	34	35.7	I. *	Ec.	Re.
13	0	52		III.	Tr.	In.
	3	38		III.	Tr.	Eg.
	3	40		II.	Oc.	Dis.
	5	15		I.	Tr.	In.
	6	7		III.	Sh.	In.
	6	35		I.	Sh.	In.
	7	31		I. *	Tr.	Eg.
	8	51		I. *	Sh.	Eg.
	8	58	24.2	II. *	Ec.	Re.
	9	1		III.*	Sh.	Eg.
14	2	30		I.	Oc.	Dis.
	6	3	30.3	I.	Ec.	Re.
	22	20		II.	Tr.	In.
	23	44		I.	Tr.	In.
15	0	55		II.	Sh.	In.
	1	4		I.	Sh.	In.
	1	6		II.	Tr.	Eg.
	2	0		I.	Tr.	Eg.
	3	20		I.	Sh.	Eg.
	3	41		II.	Sh.	Eg.
	20	59		I.	Oc.	Dis.
16	0	32	31.0	I.	Ec.	Re.
	14	47		III.	Oc.	Dis.
	16	58		II.	Oc.	Dis.
	17	34		III.	Oc.	Re.
	18	13		I.	Tr.	In.
	19	32		I.	Sh.	In.
	20	6	51.0	III.	Ec.	Dis.
	20	28		I.	Tr.	Eg.
	21	49		I.	Sh.	Eg.
	22	16	5.8	II.	Ec.	Re.
	22	52	19.2	III.	Ec.	Re.
17	15	28		I.	Oc.	Dis.
	19	1	23.4	I.	Ec.	Re.
18	10	28	28.9	IV.*	Ec.	Dis.
	11	27	13.3	IV.*	Ec.	Re.
	11	40		II. *	Tr.	In.
	12	41		I.	Tr.	In.
	14	1		I.	Sh.	In.
	14	14		II.	Sh.	In.
	14	26		II.	Tr.	Eg.
	14	57		I.	Tr.	Eg.
	16	17		I.	Sh.	Eg.
	17	0		II.	Sh.	Eg.
19	9	57		I. *	Oc.	Dis.
	13	30	23.6	I.	Ec.	Re.
20	4	54		III.	Tr.	In.
	6	16		II.	Oc.	Dis.
	7	10		I. *	Tr.	In.
	7	42		III.*	Tr.	Eg.
	8	30		I. *	Sh.	In.
	9	26		I. *	Tr.	Eg.
	10	7		III.*	Sh.	In.
	10	46		I. *	Sh.	Eg.
	11	33	47.2	II. *	Ec.	Re.
	13	2		III.	Sh.	Eg.
21	4	26		I.	Oc.	Dis.
	7	59	18.2	I. *	Ec.	Re.
22	1	0		II.	Tr.	In.
	1	40		I.	Tr.	In.
	2	58		I.	Sh.	In.
	3	33		II.	Sh.	In.
22	3	46		II.	Tr.	Eg.
	3	56		I.	Tr.	Eg.
	5	15		I.	Sh.	Eg.
	6	19		II.	Sh.	Eg.
	22	56		I.	Oc.	Dis.
23	2	28	18.3	I.	Ec.	Re.
	18	51		III.	Oc.	Dis.
	19	35		II.	Oc.	Dis.
	20	9		I.	Tr.	In.
	21	27		I.	Sh.	In.
	21	40		III.	Oc.	Re.
	22	25		I.	Tr.	Eg.
	23	44		I.	Sh.	Eg.
24	0	7	18.1	III.	Ec.	Dis.
	0	51	28.2	II.	Ec.	Re.
	2	53	57.5	III.	Ec.	Re.
	17	25		I.	Oc.	Dis.
	20	57	10.5	I.	Ec.	Re.
25	14	20		II.	Tr.	In.
	14	38		I.	Tr.	In.
	15	56		I.	Sh.	In.
	16	52		II.	Sh.	In.
	16	54		I.	Tr.	Eg.
	17	6		II.	Tr.	Eg.
	18	13		I.	Sh.	Eg.
	19	39		II.	Sh.	Eg.
26	7	43		IV.*	Tr.	In.
	7	48		IV.*	Tr.	Eg.
	11	54		I. *	Oc.	Dis.
	15	26	10.4	I.	Ec.	Re.
	19	19		IV.	Sh.	In.
	20	45		IV.	Sh.	Eg.
27	8	54		II. *	Oc.	Dis.
	8	59		III.*	Tr.	In.
	9	8		I. *	Tr.	In.
	10	25		I. *	Sh.	In.
	11	24		I. *	Tr.	Eg.
	11	48		III.*	Tr.	Eg.
	12	42		I.	Sh.	Eg.
	14	7		III.	Sh.	In.
	14	9	10.3	II.	Ec.	Re.
	17	3		III.	Sh.	Eg.
28	6	24		I.	Oc.	Dis.
	9	55	4.5	I. *	Ec.	Re.
29	3	37		I.	Tr.	In.
	3	41		II.	Tr.	In.
	4	53		I.	Sh.	In.
	5	53		I.	Tr.	Eg.
	6	11		II.	Sh.	In.
	6	27		II.	Tr.	Eg.
	7	10		I. *	Sh.	Eg.
	8	58		II. *	Sh.	Eg.
30	0	53		I.	Oc.	Dis.
	4	24	4.2	I.	Ec.	Re.
	22	6		I.	Tr.	In.
	22	14		II.	Oc.	Dis.
	23	0		III.	Oc.	Dis.
	23	22		I.	Sh.	In.
31	0	22		I.	Tr.	Eg.
	1	39		I.	Sh.	Eg.
	1	50		III.	Oc.	Re.
	3	26	51.5	II.	Ec.	Re.
	4	8	20.9	III.	Ec.	Dis.
	6	56	11.3	III.*	Ec.	Re.
	19	23		I.	Oc.	Dis.
	22	52	55.9	I.	Ec.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 10ʰ for an Inverting Telescope.

Day.	West.		East.
1	·32 · ·1	○	·4
2	·2	○	·3 1· ·4
3	·1	○	·2 ·3 ·4
4	○ 1· 2·	○	3· ·4
5	·2	○	·1 3· 4·
6	3· 1·	○	·2 4·
7	3·	○	·1 2· 4·
8	·3 ·12·	○	4·
9	·2 ·3	④·	1·
10	4· ·1	⊙	·2 ·3
11	○ 2· 4· 1	○	· 3·
12	4· ·2	○	3· ·1 ●
13	4· 3 ·1·	○	·2
14	·4 3·	○	·1 2·
15	·4 ·3 2· 1·	○	
16	·4 ·2 ·3	○	1·
17	·1 ·4	○	·2 ·3
18	2	○	· 1· ·4 ·3
19	2·	○	3· ·4 ·1 ●
20	1· 3·	○	·4 ·2 ●
21	3·	○	·1 2· ·4
22	·3 2· 1·	○	4·
23	·2 ·3	○	·1 4·
24	·1	○	·2 3 4·
25		○	2· 1· 4· ·3
26	○ 4· 2· ·1	○	3·
27	○ 1· ○ 3· 4·	○	·2 ●
28	4· 3·	○	·1 2·
29	4· ·3 1· 2·	○	
30	4· ·2 3	○	·1
31	.4 ·1	○	·3·2

WASHINGTON MEAN TIME.

APRIL.

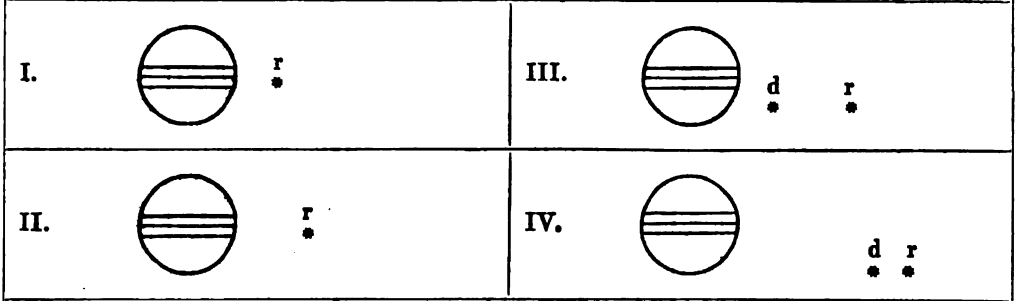
d	h	m	s			
1	16	36		I.	Tr.	In.
	17	2		II.	Tr.	In.
	17	51		I.	Sh.	In.
	18	52		I.	Tr.	Eg.
	19	30		II.	Sh.	In.
	19	49		II.	Tr.	Eg.
	20	8		I.	Sh.	Eg.
	22	17		II.	Sh.	Eg.
2	13	52		I.	Oc.	Dis.
	17	21	54.9	I.	Ec.	Re.
3	11	5		I. *	Tr.	In.
	11	34		II.	Oc.	Dis.
	12	20		I.	Sh.	In.
	13	8		III.	Tr.	In.
	13	21		I.	Tr.	Eg.
	14	37		I.	Sh.	Eg.
	15	59		III.	Tr.	Eg.
	16	44	34.3	II.	Ec.	Re.
	16	49		IV.	Oc.	Dis.
	17	31		IV.	Oc.	Re.
	18	7		III.	Sh.	In.
	21	4		III.	Sh.	Eg.
4	4	24	46.1	IV.	Ec.	Dis.
	5	51	2.1	IV.	Ec.	Re.
	8	22		I. *	Oc.	Dis.
	11	50	48.2	I.	Ec.	Re.
5	5	35		I.	Tr.	In.
	6	24		II.	Tr.	In.
	6	49		I.	Sh.	In.
	7	51		I. *	Tr.	Eg.
	8	49		II. *	Sh.	In.
	9	6		I. *	Sh.	Eg.
	9	11		II. *	Tr.	Eg.
	11	36		II.	Sh.	Eg.
6	2	51		I.	Oc.	Dis.
	6	19	47.4	I.	Ec.	Re.
7	0	4		I.	Tr.	In.
	0	54		II.	Oc.	Dis.
	1	17		I.	Sh.	In.
	2	20		I.	Tr.	Eg.
	3	11		III.	Oc.	Dis.
	3	34		I.	Sh.	Eg.
	6	2		III.	Oc.	Re.
	6	2	15.6	II.	Ec.	Re.
	8	8	53.2	III.*	Ec.	Dis.
	10	57	53.8	III.*	Ec.	Re.
	21	21		I.	Oc.	Dis.
8	0	48	38.6	I.	Ec.	Re.
	18	34		I.	Tr.	In.
	19	46		I.	Sh.	In.
	19	46		II.	Tr.	In.
	20	50		I.	Tr.	Eg.
	22	3		I.	Sh.	Eg.
	22	9		II.	Sh.	In.
	22	33		II.	Tr.	Eg.
9	0	56		II.	Sh.	Eg.
	15	51		I.	Oc.	Dis.
	19	17	36.5	I.	Ec.	Re.
10	13	3		I.	Tr.	In.
	14	15		I.	Sh.	In.
	14	15		II.	Oc.	Dis.
	15	19		I.	Tr.	Eg.
	16	32		I.	Sh.	Eg.
	17	20		III.	Tr.	In.
	19	19	59.1	II.	Ec.	Re.
	20	12		III.	Tr.	Eg.
	22	6		III.	Sh.	In.
11	1	5		III.	Sh.	Eg.
	10	20		I. *	Oc.	Dis.
	13	46	29.2	I.	Ec.	Re.
12	2	22		IV.	Tr.	In.
	3	23		IV.	Tr.	Eg.
	7	33		I. *	Tr.	In.
	8	43		I. *	Sh.	In.
	9	8		II. *	Tr.	In.
	9	49		I. *	Tr.	Eg.
	11	0		I. *	Sh.	Eg.
	11	28		II.	Sh.	In.
	11	55		II.	Tr.	Eg.
	13	16		IV.	Sh.	In.
	14	15		II.	Sh.	Eg.
	15	4		IV.	Sh.	Eg.
13	4	50		I.	Oc.	Dis.
	8	15	27.6	I. *	Ec.	Re.
14	2	2		I.	Tr.	In.
	3	12		I.	Sh.	In.
	3	36		II.	Oc.	Dis.
	4	18		I.	Tr.	Eg.
	5	29		I.	Sh.	Eg.
	7	26		III.*	Oc.	Dis.
	8	37	40.8	II. *	Ec.	Re.
	10	18		III.*	Oc.	Re.
	12	9	37.2	III.	Ec.	Dis.
	14	59	46.8	III.	Ec.	Re.
	23	20		I.	Oc.	Dis.
15	2	44	17.7	I.	Ec.	Re.
	20	32		I.	Tr.	In.
	21	41		I.	Sh.	In.
	22	31		II.	Tr.	In.
	22	48		I.	Tr.	Eg.
	23	58		I.	Sh.	Eg.
16	0	47		II.	Sh.	In.
	1	18		II.	Tr.	Eg.
	3	34		II.	Sh.	Eg.
	17	50		I.	Oc.	Dis.
	21	13	15.0	I.	Ec.	Re.
17	15	2		I.	Tr.	In.
	16	10		I.	Sh.	In.
	16	57		II.	Oc.	Dis.
	17	18		I.	Tr.	Eg.
	18	26		I.	Sh.	Eg.
	21	35		III.	Tr.	In.
	21	55	24.7	II.	Ec.	Re.
18	0	28		III.	Tr.	Eg.
	2	6		III.	Sh.	In.
	5	6		III.	Sh.	Eg.
	12	20		I.	Oc.	Dis.
	15	42	6.5	I.	Ec.	Re.
19	9	31		I. *	Tr.	In.
	10	38		I. *	Sh.	In.
	11	48		I.	Tr.	Eg.
	11	54		II.	Tr.	In.
	12	55		I.	Sh.	Eg.
	14	6		II.	Sh.	In.
	14	41		II.	Tr.	Eg.
	16	53		II.	Sh.	Eg.
20	6	50		I.	Oc.	Dis.
	10	11	3.6	I. *	Ec.	Re.
	12	2		IV.	Oc.	Dis.
	13	18		IV.	Oc.	Re.
	22	24	9.4	IV.	Ec.	Dis.
21	0	11	0.0	IV.	Ec.	Re.
	4	1		I.	Tr.	In.
	5	7		I.	Sh.	In.
21	6	18		I.	Tr.	Eg.
	6	19		II.	Oc.	Dis.
	7	24		I. *	Sh.	Eg.
	11	13	7.5	II.	Ec.	Re.
	11	42		III.	Oc.	Dis.
	14	36		III.	Oc.	Re.
	16	9	43.7	III.	Ec.	Dis.
	19	1	1.7	III.	Ec.	Re.
22	1	20		I.	Oc.	Dis.
	4	39	52.7	I.	Ec.	Re.
	22	31		I.	Tr.	In.
	23	36		I.	Sh.	In.
23	0	48		I.	Tr.	Eg.
	1	17		II.	Tr.	In.
	1	52		I.	Sh.	Eg.
	3	25		II.	Sh.	In.
	4	4		II.	Tr.	Eg.
	6	12		II.	Sh.	Eg.
	19	50		I.	Oc.	Dis.
	23	8	48.5	I.	Ec.	Re.
24	17	1		I.	Tr.	In.
	18	5		I.	Sh.	In.
	19	18		I.	Tr.	Eg.
	19	41		II.	Oc.	Dis.
	20	21		I.	Sh.	Eg.
25	0	30	52.3	II.	Ec.	Re.
	1	53		III.	Tr.	In.
	4	48		III.	Tr.	Eg.
	6	6		III.	Sh.	In.
	9	7		III.*	Sh.	Eg.
	14	20		I.	Oc.	Dis.
	17	37	38.9	I.	Ec.	Re.
26	11	31		I.	Tr.	In.
	12	34		I.	Sh.	In.
	13	48		I.	Tr.	Eg.
	14	40		II.	Tr.	In.
	14	50		I.	Sh.	Eg.
	16	44		II.	Sh.	In.
	17	27		II.	Tr.	Eg.
	19	31		II.	Sh.	Eg.
27	8	50		I. *	Oc.	Dis.
	12	6	34.9	I.	Ec.	Re.
28	6	1		I.	Tr.	In.
	7	2		I.	Sh.	In.
	8	18		I. *	Tr.	Eg.
	9	3		II. *	Oc.	Dis.
	9	19		I. *	Sh.	Eg.
	13	48	36.6	II.	Ec.	Re.
	16	1		III.	Oc.	Dis.
	18	56		III.	Oc.	Re.
	20	9	38.3	III.	Ec.	Dis.
	21	50		IV.	Tr.	In.
	23	2	4.1	III.	Ec.	Re.
	23	21		IV.	Tr.	Eg.
29	3	20		I.	Oc.	Dis.
	6	35	24.0	I.	Ec.	Re.
	7	14		IV.	Sh.	In.
	9	19		IV.*	Sh.	Eg.
30	0	31		I.	Tr.	In.
	1	31		I.	Sh.	In.
	2	48		I.	Tr.	Eg.
	3	48		I.	Sh.	Eg.
	4	4		II.	Tr.	In.
	6	3		II.	Sh.	In.
	6	51		II.	Tr.	Eg.
	8	50		II. *	Sh.	Eg.
	21	50		I.	Oc.	Dis.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 9h 30m for an Inverting Telescope.

Day.	West.		East.
1	·4	○	2· 1· ·3
2	·4 2· ·1	○	3·
3	·4 ·2	○	3· 1·
4	3·	○	·4 ·2 ·1 ●
5	3· 1·2·	○	.4
6	·3 ·4	○	·1 ·4
7	1·	○	·2 ·4 ·3 ●
8		⊙	1· 2· ·3 4·
9	2· ·1	○	3· 4·
10	·2	○	1· 3· 4·
11	3· ·	○1	4· ·2
12	○1· ○2· 3· 4·	○	
13	4· ·3 ·2	○	·1
14	4· 1·	○	·2 ·3 ●
15	4·	○	·12· ·3
16	·4 2· 1·	○	3·
17	·4 ·2	○	1· 3·
18	·4 3· ·1	○	·2
19	3· ·4 1	○	·2·
20	·32· ·	○4	·1 ●
21	1· ·	○3	·4 ·2 ●
22		○	·1 2· ·3 ·4
23	1·2·	○	3· ·4
24	·2	○	1· 3· ·4
25	1 3·	○	·2 4·
26	3·	○	1· 2· 4·
27	·3 2·	○	4· ·1 ●
28	·31·	○	4· ·2 ●
29	4·	○	·1 2· 3
30	4· 1· 2·	○	·3

WASHINGTON MEAN TIME.

MAY.

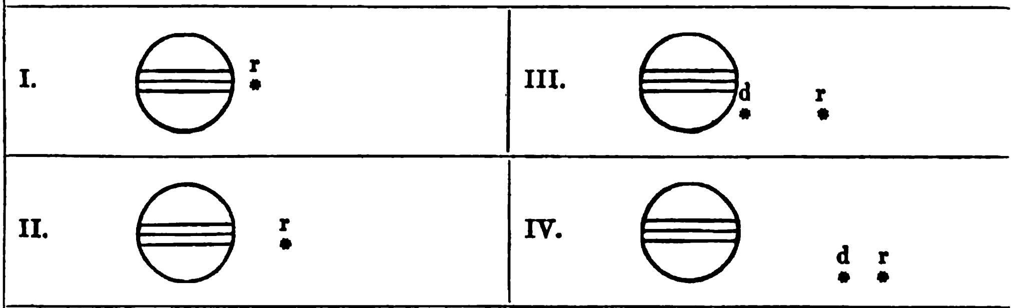
d	h	m	s			
1	1	4	17.3	I.	Ec.	Re.
	19	1		I.	Tr.	In.
	20	0		I.	Sh.	In.
	21	18		I.	Tr.	Eg.
	22	16		I.	Sh.	Eg.
	22	26		II.	Oc.	Dis.
2	3	6	22.4	II.	Ec.	Re.
	6	13		III.	Tr.	In.
	9	9		III.*	Tr.	Eg.
	10	7		III.	Sh.	In.
	13	8		III.	Sh.	Eg.
	16	20		I.	Oc.	Dis.
	19	33	6.5	I.	Ec.	Re.
3	13	31		I.	Tr.	In.
	14	28		I.	Sh.	In.
	15	48		I.	Tr.	Eg.
	16	45		I.	Sh.	Eg.
	17	28		II.	Tr.	In.
	19	22		II.	Sh.	In.
	20	15		II.	Tr.	Eg.
	22	9		II.	Sh.	Eg.
4	10	50		I.	Oc.	Dis.
	14	2	1.2	I.	Ec.	Re.
5	8	1		I. *	Tr.	In.
	8	57		I. *	Sh.	In.
	10	18		I.	Tr.	Eg.
	11	14		I.	Sh.	Eg.
	11	49		II.	Oc.	Dis.
	16	24	8.2	II.	Ec.	Re.
	20	22		III.	Oc.	Dis.
	23	19		III.	Oc.	Re.
6	0	9	36.4	III.	Ec.	Dis.
	3	3	9.4	III.	Ec.	Re.
	5	20		I.	Oc.	Dis.
	8	30	47.9	I. *	Ec.	Re.
7	2	31		I.	Tr.	In.
	3	26		I.	Sh.	In.
	4	48		I.	Tr.	Eg.
	5	43		I.	Sh.	Eg.
	6	52		II.	Tr.	In.
	7	50		IV.*	Oc.	Dis.
	8	40		II.*	Sh.	In.
	9	33		IV.*	Oc.	Re.
	9	39		II.*	Tr.	Eg.
	11	28		II.	Sh.	Eg.
	16	25	17.4	IV.	Ec.	Dis.
	18	29	15.0	IV.	Ec.	Re.
	23	51		I.	Oc.	Dis.
8	2	59	40.9	I.	Ec.	Re.
	21	1		I.	Tr.	In.
	21	54		I.	Sh.	In.
	23	18		I.	Tr.	Eg.
9	0	12		I.	Sh.	Eg.
	1	12		II.	Oc.	Dis.
	5	41	54.6	II.	Ec.	Re.
	10	35		III.	Tr.	In.
	13	33		III.	Tr.	Eg.
	14	7		III.	Sh.	In.
	17	9		III.	Sh.	Eg.
	18	21		I.	Oc.	Dis.
	21	28	28.6	I.	Ec.	Re.
10	15	31		I.	Tr.	In.
	16	23		I.	Sh.	In.
	17	48		I.	Tr.	Eg.
	18	41		I.	Sh.	Eg.
	20	16		II.	Tr.	In.
	21	58		II.	Sh.	In.
	23	3		II.	Tr.	Eg.
11	0	47		II.	Sh.	Eg.
	12	51		I.	Oc.	Dis.
	15	57	21.9	I.	Ec.	Re.
12	10	1		I.	Tr.	In.
	10	52		I.	Sh.	In.
	12	18		I.	Tr.	Eg.
	13	9		I.	Sh.	Eg.
	14	35		II.	Oc.	Dis.
	18	59	42.4	II.	Ec.	Re.
13	0	45		III.	Oc.	Dis.
	3	43		III.	Oc.	Re.
	4	9	35.1	III.	Ec.	Dis.
	7	4	15.1	III.	Ec.	Re.
	7	21		I.	Oc.	Dis.
	10	26	7.6	I.	Ec.	Re.
14	4	31		I.	Tr.	In.
	5	20		I.	Sh.	In.
	6	48		I.	Tr.	Eg.
	7	38		I. *	Sh.	Eg.
	9	41		II.	Tr.	In.
	11	17		II.	Sh.	In.
	12	28		II.	Tr.	Eg.
	14	6		II.	Sh.	Eg.
15	1	52		I.	Oc.	Dis.
	4	54	59.0	I.	Ec.	Re.
	17	49		IV.	Tr.	In.
	19	42		IV.	Tr.	Eg.
	23	1		I.	Tr.	In.
	23	49		I.	Sh.	In.
16	1	13		IV.	Sh.	In.
	1	18		I.	Tr.	Eg.
	2	7		I.	Sh.	Eg.
	3	33		IV.	Sh.	Eg.
	3	58		II.	Oc.	Dis.
	8	17	29.5	II. *	Ec.	Re.
	14	57		III.	Tr.	In.
	17	56		III.	Tr.	Eg.
	18	6		III.	Sh.	In.
	20	22		I.	Oc.	Dis.
	21	10		III.	Sh.	Eg.
	23	23	45.3	I.	Ec.	Re.
17	17	31		I.	Tr.	In.
	18	18		I.	Sh.	In.
	19	48		I.	Tr.	Eg.
	20	36		I.	Sh.	Eg.
	23	5		II.	Tr.	In.
18	0	35		II.	Sh.	In.
	1	53		II.	Tr.	Eg.
	3	25		II.	Sh.	Eg.
	14	52		I.	Oc.	Dis.
	17	52	37.2	I.	Ec.	Re.
19	12	2		I.	Tr.	In.
	12	46		I.	Sh.	In.
	14	19		I.	Tr.	Eg.
	15	4		I.	Sh.	Eg.
	17	22		II.	Oc.	Dis.
	21	35	19.9	II.	Ec.	Re.
20	5	10		III.	Oc.	Dis.
	8	10		III.*	Oc.	Re.
	8	10	5.7	III.*	Ec.	Dis.
	9	22		I.	Oc.	Dis.
	11	5	52.1	III.	Ec.	Re.
	12	21	21.3	I.	Ec.	Re.
21	6	32		I.	Tr.	In.
	7	15		I. *	Sh.	In.
	8	49		I. *	Tr.	Eg.
	9	33		I.	Sh.	Eg.
21	12	30		II.	Tr.	In.
	13	54		II.	Sh.	In.
	15	18		II.	Tr.	Eg.
	16	43		II.	Sh.	Eg.
22	3	53		I.	Oc.	Dis.
	6	50	11.0	I.	Ec.	Re.
23	1	2		I.	Tr.	In.
	1	44		I.	Sh.	In.
	3	19		I.	Tr.	Eg.
	4	2		I.	Sh.	Eg.
	6	46		II.	Oc.	Dis.
	10	53	7.7	II.	Ec.	Re.
	19	22		III.	Tr.	In.
	22	5		III.	Sh.	In.
	22	23		I.	Oc.	Dis.
	22	23		III.	Tr.	Eg.
24	1	10		III.	Sh.	Eg.
	1	18	55.8	I.	Ec.	Re.
	4	4		IV.	Oc.	Dis.
	6	8		IV.	Oc.	Re.
	10	26	18.8	IV.	Ec.	Dis.
	12	45	11.0	IV.	Ec.	Re.
	19	33		I.	Tr.	In.
	20	12		I.	Sh.	In.
	21	50		I.	Tr.	Eg.
	22	30		I.	Sh.	Eg.
25	1	54		II.	Tr.	In.
	3	12		II.	Sh.	In.
	4	42		II.	Tr.	Eg.
	6	1		II.	Sh.	Eg.
	16	54		I.	Oc.	Dis.
	19	47	46.0	I.	Ec.	Re.
26	14	3		I.	Tr.	In.
	14	41		I.	Sh.	In.
	16	20		I.	Tr.	Eg.
	16	59		I.	Sh.	Eg.
	20	10		II.	Oc.	Dis.
27	0	11	1.0	II.	Ec.	Re.
	9	36		III.	Oc.	Dis.
	11	24		I.	Oc.	Dis.
	14	16	28.4	I.	Ec.	Re.
	15	6	53.0	III.	Ec.	Re.
28	8	33		I. *	Tr.	In.
	9	10		I.	Sh.	In.
	10	50		I.	Tr.	Eg.
	11	28		I.	Sh.	Eg.
	15	19		II.	Tr.	In.
	16	31		II.	Sh.	In.
	18	7		II.	Tr.	Eg.
	19	20		II.	Sh.	Eg.
29	5	54		I.	Oc.	Dis.
	8	45	16.3	I.	Ec.	Re.
30	3	3		I.	Tr.	In.
	3	38		I.	Sh.	In.
	5	21		I.	Tr.	Eg.
	5	56		I.	Sh.	Eg.
	9	34		II.	Oc.	Dis.
	13	28	49.3	II.	Ec.	Re.
	23	48		III.	Tr.	In.
31	0	25		I.	Oc.	Dis.
	2	4		III.	Sh.	In.
	2	50		III.	Tr.	Eg.
	3	13	59.4	I.	Ec.	Re.
	5	11		III.	Sh.	Eg.
	21	33		I.	Tr.	In.
	22	7		I.	Sh.	In.
	23	51		I.	Tr.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 9ʰ for an Inverting Telescope.

Day.	West.		East.
1	4· ·2	○	·1 3·
2	○ 3· 4· ·1	○	·2
3	·4 3·	○	1· 2·
4	·4 ·3 2· ·1	○	
5	○ 1· ·4 ·3 ·2	○	
6	·4	○	·1 ·3 ·2
7	○ 2· 1·	○	·3 ·4 ●
8	·2	○	·1 ·4 3·
9	·1	3○ ·	·2 ·4
10	3·	⊙	1· 2· ·4
11	·3 2· ·1	○	·4
12	·3 ·2	1○ ·	4·
13		○	·3 ·2 4· ·1 ●
14	○ 2· 1·	○	4· ·3
15	·2	○	4· ·1 3·
16	4· 1·	○	3· ·2
17	4· 3·	○	1· 2·
18	4· 3· 2· ·1	○	
19	4· ·3 ·2	○	1·
20	·4	· ○1	·2 ·3 ●
21	·4	1·○	2· ·3
22	·4 2·	○	·1 3·
23	·4 1·	○	3· ·2 ●
24	3·	○	·4 ·1 2·
25	3· ·12·	○	·4
26	·3 ·2	○	1· ·4
27	·1	· ○3	·2 ·4
28	○ 1·	○	2· ·3 ·4
29	2·	○	·1 3· 4·
30	1·	· ○2	3· 4·
31	3·	○	·1 2· 4·

WASHINGTON MEAN TIME.

AUGUST.

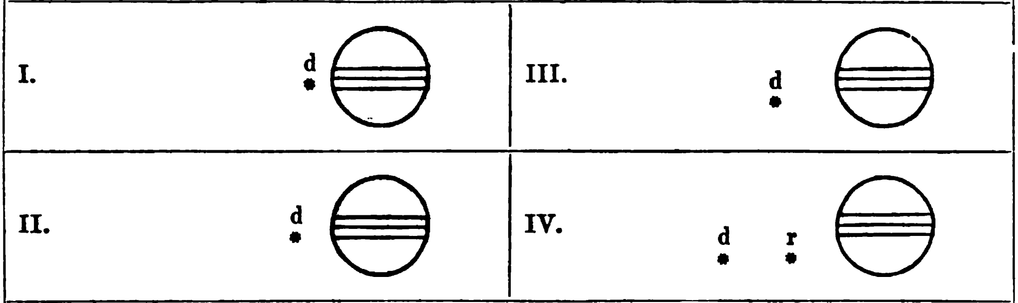
d	h	m	s			
1	2	25		I.	Oc.	Re.
	20	48		I.	Sh.	In.
	21	17		I.	Tr.	In.
	23	6		I.	Sh.	Eg.
	23	35		I.	Tr.	Eg.
2	10	7	18.4	II.	Ec.	Dis.
	13	53		II.	Oc.	Re.
	18	10	42.8	I.	Ec.	Dis.
	20	55		I.	Oc.	Re.
3	13	57		III.	Sh.	In.
	15	17		I.	Sh.	In.
	15	47		I.	Tr.	In.
	15	55		III.	Tr.	In.
	17	12		III.	Sh.	Eg.
	17	35		I.	Sh.	Eg.
	18	5		I.	Tr.	Eg.
	19	13		III.	Tr.	Eg.
4	5	11		II.	Sh.	In.
	6	11		II.	Tr.	In.
	8	2		II.	Sh.	Eg.
	9	2		II.	Tr.	Eg.
	12	39	14.0	I.	Ec.	Dis.
	15	25		I.	Oc.	Re.
5	9	45		I.	Sh.	In.
	10	17		I.	Tr.	In.
	12	3		I.	Sh.	Eg.
	12	35		I.	Tr.	Eg.
	23	25	41.8	II.	Ec.	Dis.
6	3	18		II.	Oc.	Re.
	7	7	40.1	I.	Ec.	Dis.
	9	56		I.	Oc.	Re.
7	4	1	55.9	III.	Ec.	Dis.
	4	14		I.	Sh.	In.
	4	47		I.	Tr.	In.
	6	32		I.	Sh.	Eg.
	7	5		I.	Tr.	Eg.
	9	27		III.	Oc.	Re.
	18	29		II.	Sh.	In.
	19	7		IV.	Sh.	In.
	19	36		II.	Tr.	In.
	21	20		II.	Sh.	Eg.
	22	24		IV.	Sh.	Eg.
	22	27		II.	Tr.	Eg.
8	0	22		IV.	Tr.	In.
	1	36	8.4	I.	Ec.	Dis.
	3	49		IV.	Tr.	Eg.
	4	26		I.	Oc.	Re.
	22	42		I.	Sh.	In.
	23	17		I.	Tr.	In.
9	1	0		I.	Sh.	Eg.
	1	35		I.	Tr.	Eg.
	12	43	21.9	II.	Ec.	Dis.
	16	43		II. *	Oc.	Re.
	20	4	33.8	I.	Ec.	Dis.
	22	56		I.	Oc.	Re.
10	17	11		I.	Sh.	In.
	17	47		I.	Tr.	In.
	17	56		III.	Sh.	In.
	19	29		I.	Sh.	Eg.
	20	5		I.	Tr.	Eg.
	20	21		III.	Tr.	In.
	21	13		III.	Sh.	Eg.
	23	40		III.	Tr.	Eg.
11	7	46		II.	Sh.	Iu.
	9	0		II.	Tr.	In.
11	10	37		II.	Sh.	Eg.
	11	51		II.	Tr.	Eg.
	14	33	3.3	I.	Ec.	Dis.
	17	26		I.	Oc.	Re.
12	11	40		I.	Sh.	In.
	12	17		I.	Tr.	In.
	13	57		I.	Sh.	Eg.
	14	35		I.	Tr.	Eg.
13	2	1	49.3	II.	Ec.	Dis.
	6	8		II.	Oc.	Re.
	9	1	28.3	I.	Ec.	Dis.
	11	56		I.	Oc.	Re.
14	6	8		I.	Sh.	In.
	6	47		I.	Tr.	In.
	8	0	23.0	III.	Ec.	Dis.
	8	26		I.	Sh.	Eg.
	9	5		I.	Tr.	Eg.
	13	54		III.	Oc.	Re.
	21	3		II.	Sh.	In.
	22	24		II.	Tr.	In.
	23	54		II.	Sh.	Eg.
15	1	15		II.	Tr.	Eg.
	3	29	54.7	I.	Ec.	Dis.
	6	26		I.	Oc.	Re.
16	0	36		I.	Sh.	In.
	1	17		I.	Tr.	In.
	2	54		I.	Sh.	Eg.
	3	35		I.	Tr.	Eg.
	4	32	8.1	IV.	Ec.	Dis.
	7	46	40.3	IV.	Ec.	Re.
	10	57		IV.	Oc.	Dis.
	14	32		IV.	Oc.	Re.
	15	19	29.4	II. *	Ec.	Dis.
	19	32		II.	Oc.	Re.
	21	58	19.0	I.	Ec.	Dis.
17	0	56		I.	Oc.	Re.
	19	5		I.	Sh.	In.
	19	47		I.	Tr.	In.
	21	23		I.	Sh.	Eg.
	21	55		III.	Sh.	In.
	22	6		I.	Tr.	Eg.
18	0	45		III.	Tr.	In.
	1	12		III.	Sh.	Eg.
	4	6		III.	Tr.	Eg.
	10	20		II.	Sh.	In.
	11	47		II.	Tr.	In.
	13	11		II.	Sh.	Eg.
	14	38		II.	Tr.	Eg.
	16	26	46.6	I. *	Ec.	Dis.
	19	26		I.	Oc.	Re.
19	13	33		I.	Sh.	In.
	14	17		I.	Tr.	In.
	15	52		I. *	Sh.	Eg.
	16	36		I. *	Tr.	Eg.
20	4	38	0.5	II.	Ec.	Dis.
	8	57		II.	Oc.	Re.
	10	55	10.1	I.	Ec.	Dis.
	13	56		I.	Oc.	Re.
21	8	2		I.	Sh.	In.
	8	47		I.	Tr.	In.
	10	21		I.	Sh.	Eg.
	11	6		I.	Tr.	Eg.
	11	58	48.7	III.	Ec.	Dis.
	18	19		III.	Oc.	Re.
21	23	37		II.	Sh.	In.
22	1	10		II.	Tr.	In.
	2	28		II.	Sh.	Eg.
	4	1		II.	Tr.	Eg.
	5	23	34.6	I.	Ec.	Dis.
	8	26		I.	Oc.	Re.
23	2	30		I.	Sh.	In.
	3	17		I.	Tr.	In.
	4	49		I.	Sh.	Eg.
	5	36		I.	Tr.	Eg.
	17	55	40.4	II.	Ec.	Dis.
	22	21		II.	Oc.	Re.
	23	51	57.4	I.	Ec.	Dis.
24	2	56		I.	Oc.	Re.
	13	5		IV.	Sh.	In.
	16	30		IV. *	Sh.	Eg.
	20	38		IV.	Tr.	In.
	20	59		I.	Sh.	In.
	21	47		I.	Tr.	In.
	23	18		I.	Sh.	Eg.
25	0	6		I.	Tr.	Eg.
	0	20		IV.	Tr.	Eg.
	1	53		III.	Sh.	In.
	5	8		III.	Tr.	In.
	5	11		III.	Sh.	Eg.
	8	30		III.	Tr.	Eg.
	12	54		II.	Sh.	In.
	14	33		II.	Tr.	In.
	15	45		II. *	Sh.	Eg.
	17	25		II.	Tr.	Eg.
	18	20	23.3	I.	Ec.	Dis.
	21	26		I.	Oc.	Re.
26	15	27		I. *	Sh.	In.
	16	17		I. *	Tr.	In.
	17	47		I.	Sh.	Eg.
	18	36		I.	Tr.	Eg.
27	7	14	14.5	II.	Ec.	Dis.
	11	46		II.	Oc.	Re.
	12	48	45.6	I.	Ec.	Dis.
	15	56		I. *	Oc.	Re.
28	9	56		I.	Sh.	In.
	10	47		I.	Tr.	In.
	12	15		I.	Sh.	Eg.
	13	6		I.	Tr.	Eg.
	15	57	46.4	III.*	Ec.	Dis.
	19	7	26.2	III.	Ec.	Re.
	19	20		III.	Oc.	Dis.
	22	43		III.	Oc.	Re.
29	2	11		II.	Sh.	In.
	3	56		II.	Tr.	In.
	5	2		II.	Sh.	Eg.
	6	48		II.	Tr.	Eg.
	7	17	8.5	I.	Ec.	Dis.
	10	25		I.	Oc.	Re.
30	4	24		I.	Sh.	In.
	5	17		I.	Tr.	In.
	6	44		I.	Sh.	Eg.
	7	36		I.	Tr.	Eg.
	20	31	54.3	II.	Ec.	Dis.
31	1	10		II.	Oc.	Re.
	1	45	29.5	I.	Ec.	Dis.
	4	55		I.	Oc.	Re.
	22	53		I.	Sh.	In.
	23	47		I.	Tr.	In.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation: Tr., transit of the satellite: Sh., transit of the shadow; *Visible at Washington.

WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 15ʰ for an Inverting Telescope.

Day.	West.		East.
1	2·	○	1· ·3 ·4
2	·1	○	·2 3· ·4
3	3 1	○	: 2· ·4
4	3· 2·	○	4· ·1 ●
5	·3 ·2 1·	○	4·
6	·3	○	·1 ·2 4·
7	1·	○	2· 4· 3
8	2· 4·	⊙	1· ·3
9	4· ·1	○	3· ·2 ●
10	4·	○	1· 3· 2·
11	4· 3· 2·	○	·1 ●
12	·4 3· ·2 1·	○	
13	·4 ·3	○	·1 ·2
14	·4 1·	○	·3 2·
15	2··4	○	·1 ·3
16	·1 ·2	○	·4 3·
17		○	1 ·3· 2 4
18	3· ·1 2·	○	·4
19	○ 1· 3· ·2	○	·4
20	·3	○	·1 ·2 ·4
21	1·	○	2· 4· ·3 ●
22	2·	○	·1 ·3 4·
23	1· ·2	○	4· 3·
24		○	4· 1· 3· ·2
25	○ 2· 4· 3· ·1	○	
26	4· 3· ·2	○	1 ·
27	4· ·3	○	·2 ·1 ●
28	4· 1· 3	○	2·
29	·4 2·	○	·1 ·3
30	·4 1··2	○	·3
31	·4	○	1· 2 3·

WASHINGTON MEAN TIME.

SEPTEMBER.

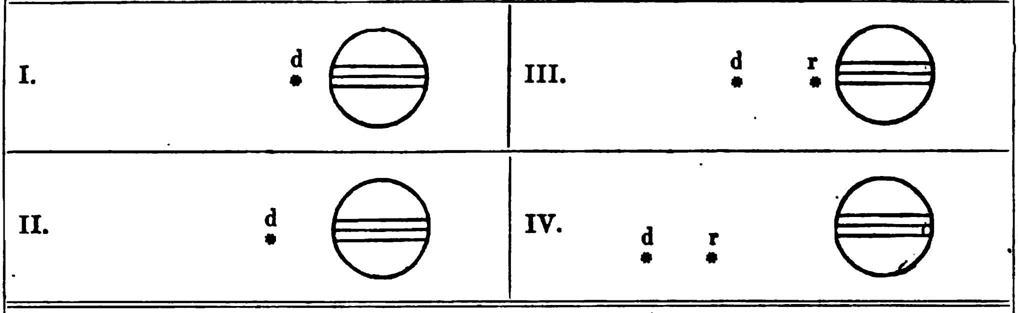
d	h	m	s			
1	1	12		I.	Sh.	Eg.
	2	6		I.	Tr.	Eg.
	5	52		III.	Sh.	In.
	9	10		III.	Sh.	Eg.
	9	29		III.	Tr.	In.
	12	53		III.	Tr.	Eg.
	15	28		II. *	Sh.	In.
	17	18		II.	Tr.	In.
	18	19		II.	Sh.	Eg.
	20	10		II.	Tr.	Eg.
	20	13	53.7	I.	Ec.	Dis.
	22	32	13.8	IV.	Ec.	Dis.
	23	25		I.	Oc.	Re.
2	1	55	30.8	IV.	Ec.	Re.
	7	8		IV.	Oc.	Dis.
	10	56		IV.	Oc.	Re.
	17	21		I.	Sh.	In.
	18	17		I.	Tr.	In.
	19	41		I.	Sh.	Eg.
	20	36		I.	Tr.	Eg.
3	9	50	31.3	II.	Ec.	Dis.
	14	34		II. *	Oc.	Re.
	14	42	14.7	I. *	Ec.	Dis.
	17	54		I.	Oc.	Re.
4	11	50		I.	Sh.	In.
	12	47		I.	Tr.	In.
	14	9		I.	Sh.	Eg.
	15	6		I. *	Tr.	Eg.
	19	56	6.2	III.	Ec.	Dis.
	23	6	38.8	III.	Ec.	Re.
	23	40		III.	Oc.	Dis.
5	3	4		III.	Oc.	Re.
	4	45		II.	Sh.	In.
	6	41		II.	Tr.	In.
	7	36		II.	Sh.	Eg.
	9	10	36.3	I.	Ec.	Dis.
	9	33		II.	Tr.	Eg.
	12	24		I.	Oc.	Re.
6	6	18		I.	Sh.	In.
	7	17		I.	Tr.	In.
	8	37		I.	Sh.	Eg.
	9	36		I.	Tr.	Eg.
	23	8	10.9	II.	Ec.	Dis.
7	3	38	55.9	I.	Ec.	Dis.
	3	57		II.	Oc.	Re.
	6	54		I.	Oc.	Re.
8	0	47		I.	Sh.	In.
	1	46		I.	Tr.	In.
	3	6		I.	Sh.	Eg.
	4	5		I.	Tr.	Eg.
	9	50		III.	Sh.	In.
	13	10		III.	Sh.	Eg.
	13	48		III.	Tr.	In.
	17	13		III.	Tr.	Eg.
	18	2		II.	Sh.	In.
	20	3		II.	Tr.	In.
	20	53		II.	Sh.	Eg.
	22	7	18.8	I.	Ec.	Dis.
	22	55		II.	Tr.	Eg.
9	1	23		I.	Oc.	Re.
	19	15		I.	Sh.	In.
	20	16		I.	Tr.	In.
	21	34		I.	Sh.	Eg.
	22	35		I.	Tr.	Eg.
10	7	3		IV.	Sh.	In.
	10	37		IV.	Sh.	Eg.
	12	26	50.3	II.	Ec.	Dis.
	16	35		IV. *	Tr.	In.
10	16	35	38.8	I. *	Ec.	Dis.
	17	21		II.	Oc.	Re.
	19	53		I.	Oc.	Re.
	20	29		IV.	Tr.	Eg.
11	13	44		I.	Sh.	In.
	14	46		I. *	Tr.	In.
	16	3		I. *	Sh.	Eg.
	17	5		I.	Tr.	Eg.
	23	54	30.7	III.	Ec.	Dis.
12	3	5	55.3	III..	Ec.	Re.
	3	58		III.	Oc.	Dis.
	7	19		II.	Sh.	In.
	7	24		III.	Oc.	Re.
	9	25		II.	Tr.	In.
	10	10		II.	Sh.	Eg.
	11	3	59.1	I.	Ec.	Dis.
	12	17		II.	Tr.	Eg.
	14	22		I. *	Oc.	Re.
13	8	12		I.	Sh.	In.
	9	15		I.	Tr.	In.
	10	31		I.	Sh.	Eg.
	11	34		I.	Tr.	Eg.
14	1	44	29.6	II.	Ec.	Dis.
	5	32	18.8	I.	Ec.	Dis.
	6	44		II.	Oc.	Re.
	8	52		I.	Oc.	Re.
15	2	41		I.	Sh.	In.
	3	45		I.	Tr.	In.
	5	0		I.	Sh.	Eg.
	6	4		I.	Tr.	Eg.
	13	48		III.*	Sh.	In.
	17	9		III.*	Sh.	Eg.
	18	5		III.	Tr.	In.
	20	36		II.	Sh.	In.
	21	32		III.	Tr.	Eg.
	22	47		II.	Tr.	In.
	23	27		II.	Sh.	Eg.
16	0	0	39.2	I.	Ec.	Dis.
	1	39		II.	Tr.	Eg.
	3	21		I.	Oc.	Re.
	21	9		I.	Sh.	In.
	22	15		I.	Tr.	In.
	23	28		I.	Sh.	Eg.
17	0	33		I.	Tr.	Eg.
	15	3	10.9	II. *	Ec.	Dis.
	18	28	58.3	I.	Ec.	Dis.
	20	7		II.	Oc.	Re.
	21	51		I.	Oc.	Re.
18	15	38		I. *	Sh.	In.
	16	32	3.7	IV.*	Ec.	Dis.
	16	44		I. *	Tr.	In.
	17	57		I.	Sh.	Eg.
	19	3		I.	Tr.	Eg.
	20	3	27.1	IV.	Ec.	Re.
19	2	54		IV.	Oc.	Dis.
	3	52	20.5	III.	Ec.	Dis.
	6	54		IV.	Oc.	Re.
	7	4	36.9	III.	Ec.	Re.
	8	13		III.	Oc.	Dis.
	9	53		II.	Sh.	In.
	11	41		III.	Oc.	Re.
	12	8		II.	Tr.	In.
	12	44		II.	Sh.	Eg.
	12	57	17.2	I.	Ec.	Dis.
	15	1		II. *	Tr.	Eg.
	16	20		I. *	Oc.	Re.
20	10	6		I.	Sh.	In.
	11	13		I.	Tr.	In.
20	12	25		I.	Sh.	Eg.
	13	32		I. *	Tr.	Eg.
21	4	20	49.5	II.	Ec.	Dis.
	7	25	35.0	I.	Ec.	Dis.
	9	29		II.	Oc.	Re.
	10	50		I.	Oc.	Re.
22	4	35		I.	Sh.	In.
	5	42		I.	Tr.	In.
	6	54		I.	Sh.	Eg.
	8	1		I.	Tr.	Eg.
	17	47		III.	Sh.	In.
	21	9		III.	Sh.	Eg.
	22	20		III.	Tr.	In.
	23	10		II.	Sh.	In.
23	1	29		II.	Tr.	In.
	1	49		III.	Tr.	Eg.
	1	53	55.2	I.	Ec.	Dis.
	2	1		II.	Sh.	Eg.
	4	22		II.	Tr.	Eg.
	5	19		I.	Oc.	Re.
	23	3		I.	Sh.	In.
24	0	12		I.	Tr.	In.
	1	22		I.	Sh.	Eg.
	2	31		I.	Tr.	Eg.
	17	39	32.4	II.	Ec.	Dis.
	20	22	13.3	I.	Ec.	Dis.
	22	51		II.	Oc.	Re.
	23	48		I.	Oc.	Re.
25	17	32		I.	Sh.	In.
	18	41		I.	Tr.	In.
	19	51		I.	Sh.	Eg.
	21	0		I.	Tr.	Eg.
26	7	50	2.0	III.	Ec.	Dis.
	11	3	9.2	III.	Ec.	Re.
	12	27		II.	Sh.	In.
	12	26		III.	Oc.	Dis.
	14	49		II. *	Tr.	In.
	14	50	30.9	I. *	Ec.	Dis.
	15	18		II. *	Sh.	Eg.
	15	55		III.*	Oc.	Re.
	17	42		II.	Tr.	Eg.
	18	17		I.	Oc.	Re.
27	1	0		IV.	Sh.	In.
	4	42		IV.	Sh.	Eg.
	12	0		I.	Sh.	In.
	12	2		IV.	Tr.	In.
	13	11		I. *	Tr.	In.
	14	19		I. *	Sh.	Eg.
	15	30		I. *	Tr.	Eg.
	16	7		IV.*	Tr.	Eg.
28	6	57	10.8	II.	Ec.	Dis.
	9	18	47.9	I.	Ec.	Dis.
	12	13		II.	Oc.	Re.
	12	46		I.	Oc.	Re.
29	6	29		I.	Sh.	In.
	7	40		I.	Tr.	In.
	8	48		I.	Sh.	Eg.
	9	59		I.	Tr.	Eg.
	21	46		III.	Sh.	In.
30	1	8		III.	Sh.	Eg.
	1	43		II.	Sh.	In.
	2	32		III.	Tr.	In.
	3	47	6.7	I.	Ec.	Dis.
	4	9		II.	Tr.	In.
	4	35		II.	Sh.	Eg.
	6	2		III.	Tr.	Eg.
	7	2		II.	Tr.	Eg.
	7	15		I.	Oc.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 15ʰ for an Inverting Telescope.

Day.	West.		East.
1	·4 ·1 3·	○	2·
2	3· 2·	○	·4 1·
3	·3	○	·2 ·4 ·1 ●
4	○ 1· ·3	○	2· ·4
5	2.	○	·1 ·3 ·4
6	·21 ·	○	·3 4·
7		○	·1 ·2 3· 4·
8	○ 3· ·1	○	2· 4·
9	3· 2·	○	1· 4·
10	·3 ·14	○	·2 ●
11	○ 1· 4· ·3	○	2·
12	4· 2·	○	·1 ·3
13	4· ·2 1·	○	·3
14	4·	○	·1·2 3·
15	·4 1·	○	3· 2·
16	·4 3·2·	○	1·
17	3 ·4 ·1 ·2	○	
18	·3 ·4	○	1· ·2
19	2·	○	·3 ·4 ·1 ●
20	·2 1·	○	3 ·4
21		○	·1 ·2 3· ·4
22	1·	○	3· 2· ·4
23	3· 2·	○	1· 4·
24	3· ·1·2	○	4·
25	·3	○	1· ·2 4·
26	○ 2·	○	4· ·1 ● ·3 ●
27	○ 1· ○ 4· ·2	○	·3
28	4·	○	·1 ·2 3·
29	4· 1·	○	3· 2·
30	4· 3· 2·	○	·1

WASHINGTON MEAN TIME.

OCTOBER.

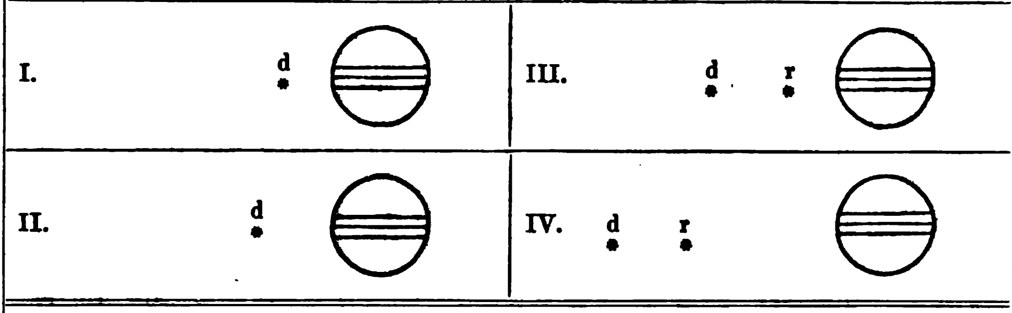
d	h	m	s				
1	0	57		I.		Sh.	In.
	2	9		I.		Tr.	In.
	3	16		I.		Sh.	Eg.
	4	28		I.		Tr.	Eg.
	20	15	54.6	II.		Ec.	Dis.
	22	15	24.5	I.		Ec.	Dis.
2	1	35		II.		Oc.	Re.
	1	45		I.		Oc.	Re.
	19	25		I.		Sh.	In.
	20	38		I.		Tr.	In.
	21	44		I.		Sh.	Eg.
	22	57		I.		Tr.	Eg.
3	11	47	54.5	III.		Ec.	Dis.
	15	0		II.	*	Sh.	In.
	15	1	51.1	III.	*	Ec.	Re.
	16	37		III.	*	Oc.	Dis.
	16	43	41.2	I.	*	Ec.	Dis.
	17	29		II.		Tr.	In.
	17	52		II.		Sh.	Eg.
	20	6		III.		Oc.	Re.
	20	14		I.		Oc.	Re.
	20	22		II.		Tr.	Eg.
4	13	54		I.	*	Sh.	In.
	15	7		I.	*	Tr.	In.
	16	13		I.	*	Sh.	Eg.
	17	26		I.	*	Tr.	Eg.
5	9	33	32.5	II.		Ec.	Dis.
	10	32	8.8	IV.		Ec.	Dis.
	11	11	57.3	I.		Ec.	Dis.
	14	11	6.2	IV.	*	Ec.	Re.
	14	43		I.	*	Oc.	Re.
	14	55		II.	*	Oc.	Re.
	22	8		IV.		Oc.	Dis.
6	2	18		IV.		Oc.	Re.
	8	22		I.		Sh.	In.
	9	36		I.		Tr.	In.
	10	41		I.		Sh.	Eg.
	11	55		I.		Tr.	Eg.
7	1	44		III.		Sh.	In.
	4	16		II.		Sh.	In.
	5	7		III.		Sh.	Eg.
	5	40	15.5	I.		Ec.	Dis.
	6	42		III.		Tr.	In.
	6	48		II.		Tr.	In.
	7	9		II.		Sh.	Eg.
	9	11		I.		Oc.	Re.
	9	42		II.		Tr.	Eg.
	10	12		III.		Tr.	Eg.
8	2	50		I.		Sh.	In.
	4	5		I.		Tr.	In.
	5	9		I.		Sh.	Eg.
	6	25		I.		Tr.	Eg.
	22	52	17.0	II.		Ec.	Dis.
9	0	8	32.7	I.		Ec.	Dis.
	3	40		I.		Oc.	Re.
	4	16		II.		Oc.	Re.
	21	19		I.		Sh.	In.
	22	34		I.		Tr.	In.
	23	38		I.		Sh.	Eg.
10	0	54		I.		Tr.	Eg.
	15	45	48.1	III.	*	Ec.	Dis.
	17	33		II.		Sh.	In.
	18	36	48.8	I.		Ec.	Dis.
	19	0	33.1	III.		Ec.	Re.
	20	7		II.		Tr.	In.
	20	26		II.		Sh.	Eg.
	20	45		III.		Oc.	Dis.
	22	9		I.		Oc.	Re.
10	23	1		II.		Tr.	Eg.
11	0	13		III.		Oc.	Re.
	15	47		I.	*	Sh.	In.
	17	3		I.	*	Tr.	In.
	18	7		I.		Sh.	Eg.
	19	23		I.		Tr.	Eg.
12	12	9	54.4	II.		Ec.	Dis.
	13	5	4.5	I.	*	Ec.	Dis.
	16	38		I.	*	Oc.	Re.
	17	37		II.		Oc.	Re.
13	10	16		I.		Sh.	In.
	11	32		I.		Tr.	In.
	12	35		I.	*	Sh.	Eg.
	13	52		I.	*	Tr.	Eg.
	18	57		IV.		Sh.	In.
	22	46		IV.		Sh.	Eg.
14	5	42		III.		Sh.	In.
	6	49		II.		Sh.	In.
	6	52		IV.		Tr.	In.
	7	33	21.7	I.		Ec.	Dis.
	9	6		III.		Sh.	Eg.
	9	25		II.		Tr.	In.
	9	42		II.		Sh.	Eg.
	10	47		III.		Tr.	In.
	11	6		I.		Oc.	Re.
	11	6		IV.		Tr.	Eg.
	12	19		II.	*	Tr.	Eg.
	14	18		III.	*	Tr.	Eg.
15	4	44		I.		Sh.	In.
	6	0		I.		Tr.	In.
	7	4		I.		Sh.	Eg.
	8	21		I.		Tr.	Eg.
16	1	28	38.9	II.		Ec.	Dis.
	2	1	38.7	I.		Ec.	Dis.
	5	35		I.		Oc.	Re.
	6	57		II.		Oc.	Re.
	23	13		I.		Sh.	In.
17	0	29		I.		Tr.	In.
	1	32		I.		Sh.	Eg.
	2	49		I.		Tr.	Eg.
	19	44	17.4	III.		Ec.	Dis.
	20	6		II.		Sh.	In.
	20	29	54.3	I.		Ec.	Dis.
	22	43		II.		Tr.	In.
	22	59		II.		Sh.	Eg.
	22	59	50.0	III.		Ec.	Re.
18	0	3		I.		Oc.	Re.
	0	48		III.		Oc.	Dis.
	1	37		II.		Tr.	Eg.
	4	20		III.		Oc.	Re.
	17	42		I.		Sh.	In.
	18	58		I.		Tr.	In.
	20	1		I.		Sh.	Eg.
	21	18		I.		Tr.	Eg.
19	14	46	15.9	II.	*	Ec.	Dis.
	14	58	9.8	I.	*	Ec.	Dis.
	18	32		I.		Oc.	Re.
	20	15		II.		Oc.	Re.
20	12	10		I.	*	Sh.	In.
	13	27		I.	*	Tr.	In.
	14	29		I.	*	Sh.	Eg.
	15	46		I.	*	Tr.	Eg.
21	9	23		II.		Sh.	In.
	9	26	26.7	I.		Ec.	Dis.
	9	40		III.		Sh.	In.
	12	0		II.	*	Tr.	In.
	12	15		II.	*	Sh.	Eg.
	13	0		I.	*	Oc.	Re.
21	13	5		III.	*	Sh.	Eg.
	14	49		III.	*	Tr.	In.
	14	54		II.	*	Tr.	Eg.
	18	21		III.		Tr.	Eg.
22	4	31	36.6	IV.		Ec.	Dis.
	6	38		I.		Sh.	In.
	7	55		I.		Tr.	In.
	8	17	38.4	IV.		Ec.	Re.
	8	58		I.		Sh.	Eg.
	10	15		I.		Tr.	Eg.
	16	39		IV.	*	Oc.	Dis.
	20	57		IV.		Oc.	Re.
23	3	54	43.3	I.		Ec.	Dis.
	4	4	59.9	II.		Ec.	Dis.
	7	29		I.		Oc.	Re.
	9	35		II.		Oc.	Re.
24	1	6		I.		Sh.	In.
	2	23		I.		Tr.	In.
	3	26		I.		Sh.	Eg.
	4	43		I.		Tr.	Eg.
	22	22	58.5	I.		Ec.	Dis.
	22	40		II.		Sh.	In.
	23	42	12.7	III.		Ec.	Dis.
25	1	17		II.		Tr.	In.
	1	32		II.		Sh.	Eg.
	1	57		I.		Oc.	Re.
	2	58	31.9	III.		Ec.	Re.
	4	11		II.		Tr.	Eg.
	4	48		III.		Oc.	Dis.
	8	21		III.		Oc.	Re.
	19	35		I.		Sh.	In.
	20	52		I.		Tr.	In.
	21	55		I.		Sh.	Eg.
	23	12		I.		Tr.	Eg.
26	16	51	13.8	I.	*	Ec.	Dis.
	17	22	36.6	II.	*	Ec.	Dis.
	20	25		I.		Oc.	Re.
	22	52		II.		Oc.	Re.
27	14	3		I.	*	Sh.	In.
	15	20		I.	*	Tr.	In.
	16	24		I.	*	Sh.	Eg.
	17	40		I.	*	Tr.	Eg.
28	11	19	30.3	I.	*	Ec.	Dis.
	11	56		II.	*	Sh.	In.
	13	38		III.	*	Sh.	In.
	14	33		II.	*	Tr.	In.
	14	48		II.	*	Sh.	Eg.
	14	54		I.	*	Oc.	Re.
	17	3		III.	*	Sh.	Eg.
	17	27		II.	*	Tr.	Eg.
	18	47		III.		Tr.	In.
	22	20		III.		Tr.	Eg.
29	8	31		I.		Sh.	In.
	9	48		I.		Tr.	In.
	10	52		I.	*	Sh.	Eg.
	12	9		I.	*	Tr.	Eg.
30	5	47	47.3	I.		Ec.	Dis.
	6	41	20.0	II.		Ec.	Dis.
	9	22		I.		Oc.	Re.
	12	11		II.	*	Oc.	Re.
	12	55		IV.	*	Sh.	In.
	16	50		IV.	*	Sh.	Eg.
31	0	56		IV.		Tr.	In.
	3	0		I.		Sh.	In.
	4	17		I.		Tr.	In.
	5	17		IV.		Tr.	Eg.
	5	20		I.		Sh.	Eg.
	6	37		I.		Tr.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 14h 30m for an Inverting Telescope.

Day.	West.		East.
1	4· 3· ·1 ·2	○	
2	·4 ·3	○	1· ·2
3	·4 ·1	○	2· ·3 ●
4	·4 2· 1	○	· ·3
5	.4	○	3· ·1 ● ·2 ●
6	1·	○	·4 3· 2·
7	2·3·	○	·4 ·1 ●
8	3· ·21·	⊙	·4
9	·3	○	1· ·2 ·4
10	·1 ·3	○	2· 4·
11	2·	○	1· ·3 4·
12		○	·34· ·1 ● ·2 ●
13	1·	○	4· 2· 3·
14	4· 2·3·	○	·1
15	3· 4· ·2 1·	○	
16	4· ·3	○	·1 ·2
17	4· ·3 ·1	○	2·
18	·4 2·	○	1· ·3
19	·4 ·2 ·1	○	·3
20	○ 1· ·4	○	· 23 ·
21	○ 2· ·4 3	○	· ·1
22	3· ·2 1· ·	○	4
23	·3	○	·2·1 ·4
24	·3 ·1	○	2· ·4
25	2·	○	1· ·3 ·4
26	·2 ·1	○	·3 ·4
27	1	○	· ·2 3· 4·
28	2	○	· 3· 4· ·1 ●
29	3· ·2 1·	○	4·
30	3·	○	·2 4· ·1
31	·3 1·4·	○	2·

WASHINGTON MEAN TIME.

NOVEMBER.

d	h	m	s			
1	0	16	2.3	I.	Ec.	Dis.
	1	13		II.	Sh.	In.
	3	40	15.4	III.	Ec.	Dis.
	3	49		II.	Tr.	In.
	3	50		I.	Oc.	Re.
	4	5		II.	Sh.	Eg.
	6	43		II.	Tr.	Eg.
	6	57	20.6	III.	Ec.	Re.
	8	44		III.	Oc.	Dis.
	12	17		III.*	Oc.	Re.
	21	28		I.	Sh.	In.
	22	45		I.	Tr.	In.
	23	48		I.	Sh.	Eg.
2	1	5		I.	Tr.	Eg.
	18	44	17.9	I.	Ec.	Dis.
	19	58	56.3	II.	Ec.	Dis.
	22	18		I.	Oc.	Re.
3	1	27		II.	Oc.	Re.
	15	57		I. *	Sh.	In.
	17	13		I. *	Tr.	In.
	18	16		I.	Sh.	Eg.
	19	33		I.	Tr.	Eg.
4	13	12	34.3	I. *	Ec.	Dis.
	14	29		II. *	Sh.	In.
	16	46		I. *	Oc.	Re.
	17	4		II. *	Tr.	In.
	17	22		II. *	Sh.	Eg.
	17	36		III.*	Sh.	In.
	19	58		II.	Tr.	Eg.
	21	2		III.	Sh.	Eg.
	22	41		III.	Tr.	In.
5	2	15		III.	Tr.	Eg.
	10	25		I.	Sh.	In.
	11	41		I. *	Tr.	In.
	12	45		I. *	Sh.	Eg.
	14	1		I. *	Tr.	Eg.
6	7	40	51.6	I.	Ec.	Dis.
	9	17	38.7	II.	Ec.	Dis.
	11	14		I. *	Oc.	Re.
	14	44		II. *	Oc.	Re.
7	4	54		I.	Sh.	In.
	6	9		I.	Tr.	In.
	7	13		I.	Sh.	Eg.
	8	29		I.	Tr.	Eg.
	22	31	2.4	IV.	Ec.	Dis.
8	2	9	6.8	I.	Ec.	Dis.
	2	23	38.6	IV.	Ec.	Re.
	3	46		II.	Sh.	In.
	5	42		I.	Oc.	Re.
	6	19		II.	Tr.	In.
	6	39		II.	Sh.	Eg.
	7	37	49.9	III.	Ec.	Dis.
	9	13		II.	Tr.	Eg.
	10	19		IV.	Oc.	Dis.
	10	55	40.1	III.*	Ec.	Re.
	12	35		III.*	Oc.	Dis.
	14	43		IV.*	Oc.	Re.
	16	9		III.*	Oc.	Re.
	23	22		I.	Sh.	In.
9	0	37		I.	Tr.	In.
	1	41		I.	Sh.	Eg.
	2	57		I.	Tr.	Eg.
	20	37	22.9	I.	Ec.	Dis.
	22	35	14.9	II.	Ec.	Dis.
10	0	9		I.	Oc.	Re.
	4	0		II.	Oc.	Re.
	17	51		I. *	Sh.	In.
	19	5		I.	Tr.	In.
10	20	10		I.	Sh.	Eg.
	21	25		I.	Tr.	Eg.
11	15	5	39.3	I. *	Ec.	Dis.
	17	2		II. *	Sh.	In.
	18	37		I.	Oc.	Re.
	19	34		II.	Tr.	In.
	19	55		II.	Sh.	Eg.
	21	35		III.	Sh.	In.
	22	28		II.	Tr.	Eg.
12	1	2		III.	Sh.	Eg.
	2	31		III.	Tr.	In.
	6	5		III.	Tr.	Eg.
	12	19		I. *	Sh.	In.
	13	33		I. *	Tr.	In.
	14	38		I. *	Sh.	Eg.
	15	53		I. *	Tr.	Eg.
13	9	33	57.2	I.	Ec.	Dis.
	11	53	55.8	II. *	Ec.	Dis.
	13	5		I. *	Oc.	Re.
	17	16		II. *	Oc.	Re.
14	6	48		I.	Sh.	In.
	8	1		I.	Tr.	In.
	9	7		I.	Sh.	Eg.
	10	21		I. *	Tr.	Eg.
15	4	2	12.9	I.	Ec.	Dis.
	6	19		II.	Sh.	In.
	7	32		I.	Oc.	Re.
	8	48		II.	Tr.	In.
	9	12		II.	Sh.	Eg.
	11	35	21.8	III.*	Ec.	Dis.
	11	42		II. *	Tr.	Eg.
	14	53	55.8	III.*	Ec.	Re.
	16	21		III.*	Oc.	Dis.
	19	56		III.	Oc.	Re.
16	1	17		I.	Sh.	In.
	2	28		I.	Tr.	In.
	3	35		I.	Sh.	Eg.
	4	48		I.	Tr.	Eg.
	6	52		IV.	Sh.	In.
	10	54		IV.*	Sh.	Eg.
	18	4		IV.*	Tr.	In.
	22	30		IV.	Tr.	Eg.
	22	30	29.3	I.	Ec.	Dis.
17	1	11	31.8	II.	Ec.	Dis.
	2	0		I.	Oc.	Re.
	6	30		II.	Oc.	Re.
	19	45		I.	Sh.	In.
	20	56		I.	Tr.	In.
	22	4		I.	Sh.	Eg.
	23	16		I.	Tr.	Eg.
18	16	58	46.3	I. *	Ec.	Dis.
	19	36		II.	Sh.	In.
	20	27		I.	Oc.	Re.
	22	1		II.	Tr.	In.
	22	29		II.	Sh.	Eg.
19	0	55		II.	Tr.	Eg.
	1	33		III.	Sh.	In.
	5	1		III.	Sh.	Eg.
	6	16		III.	Tr.	In.
	9	50		III.	Tr.	Eg.
	14	14		I. *	Sh.	In.
	15	24		I. *	Tr.	In.
	16	32		I. *	Sh.	Eg.
	17	44		I. *	Tr.	Eg.
20	11	27	5.2	I. *	Ec.	Dis.
	14	30	10.8	II. *	Ec.	Dis.
	14	54		I. *	Oc.	Re.
20	19	45		II.	Oc.	Re.
21	8	42		I.	Sh.	In.
	9	51		I. *	Tr.	In.
	11	1		I. *	Sh.	Eg.
	12	11		I. *	Tr.	Eg.
22	5	55	21.4	I.	Ec.	Dis.
	8	53		II.	Sh.	In.
	9	21		I.	Oc.	Re.
	11	13		II. *	Tr.	In.
	11	46		II. *	Sh.	Eg.
	14	7		II. *	Tr.	Eg.
	15	33	12.3	III.*	Ec.	Dis.
	18	52	29.5	III.	Ec.	Re.
	20	3		III.	Oc.	Dis.
	23	38		III.	Oc.	Re.
23	3	10		I.	Sh.	In.
	4	18		I.	Tr.	In.
	5	29		I.	Sh.	Eg.
	6	38		I.	Tr.	Eg.
24	0	23	38.8	I.	Ec.	Dis.
	3	47	46.8	II.	Ec.	Dis.
	3	49		I.	Oc.	Re.
	8	58		II.	Oc.	Re.
	16	31	0.1	IV.*	Ec.	Dis.
	20	29	40.7	IV.	Ec.	Re.
	21	38		I.	Sh.	In.
	22	45		I.	Tr.	In.
	23	57		I.	Sh.	Eg.
25	1	5		I.	Tr.	Eg.
	3	2		IV.	Oc.	Dis.
	7	29		IV.	Oc.	Re.
	18	51	56.2	I.	Ec.	Dis.
	22	10		II.	Sh.	In.
	22	16		I.	Oc.	Re.
26	0	25		II.	Tr.	In.
	1	3		II.	Sh.	Eg.
	3	19		II.	Tr.	Eg.
	5	32		III.	Sh.	In.
	9	0		III.	Sh.	Eg.
	9	56		III.*	Tr.	In.
	13	31		III.*	Tr.	Eg.
	16	7		I. *	Sh.	In.
	17	12		I. *	Tr.	In.
	18	26		I.	Sh.	Eg.
	19	32		I.	Tr.	Eg.
27	13	20	16.3	I. *	Ec.	Dis.
	16	43		I. *	Oc.	Re.
	17	6	23.8	II. *	Ec.	Dis.
	22	11		II.	Oc.	Re.
28	10	35		I. *	Sh.	In.
	11	39		I. *	Tr.	In.
	12	55		I. *	Sh.	Eg.
	13	59		I. *	Tr.	Eg.
29	7	48	33.3	I.	Ec.	Dis.
	11	10		I. *	Oc.	Re.
	11	27		II. *	Sh.	In.
	13	36		II. *	Tr.	In.
	14	20		II. *	Sh.	Eg.
	16	30		II. *	Tr.	Eg.
	19	31	8.7	III.	Ec.	Dis.
	22	51	8.7	III.	Ec.	Re.
	23	41		III.	Oc.	Dis.
30	3	16		III.	Oc.	Re.
	5	3		I.	Sh.	In.
	6	6		I.	Tr.	In.
	7	23		I.	Sh.	Eg.
	8	26		I.	Tr.	Eg.

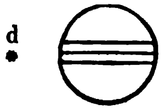
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

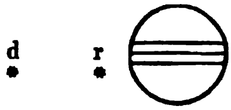
NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

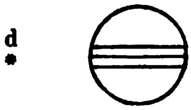
I.



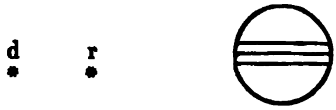
III.



II.



IV.



Configurations at 14ʰ for an Inverting Telescope.

Day.	West.		East.
1	4· 2·	○	·3 1·
2	4· ·2 ·1	○	·3
3	4·	○	1· ·2 3·
4	·4	○	2· 3· ·1 ●
5	·4 2· 3· 1·	○	
6	· 43 ·	○	·1 ·2 ●
7	·3 ·4 1·	○	2·
8	2·	○	·1 ·3 ● ·4 ●
9	·2 ·1	○	·4 ·3
10		○	1· ·2 3· ·4
11	·1	○	2· 3· ·4
12	○ 1· 2· 3·	○	·4
13	3·	○	·1 4· ·2 ●
14	·3 1·	○	2· 4·
15	2·	○	·1 4· ·3 ●
16	·21·	○	4· ·3
17	4·	○	1··2 ·3
18	4· .1	○	2· 3·
19	4· 2· 3·	○	1·
20	4· 3· ·2	○	·1 ●
21	·4 ·3 1·	○	·2
22	○ 2· ·4 ·3	○	·1
23	·4 ·2 1·	○	·3
24	·4	○	$^{1\cdot}_{\cdot 2}$ ·3
25	·1	○	·4 2· 3·
26	○ 1· 2· 3·	○	·4
27	3· ·2	○	·4 ·1 ●
28	·3 1·	○	·2 ·4
29	○ 2· ·3	○	·1 4·
30	·2 1·	○	·3 4·

WASHINGTON MEAN TIME.

DECEMBER.

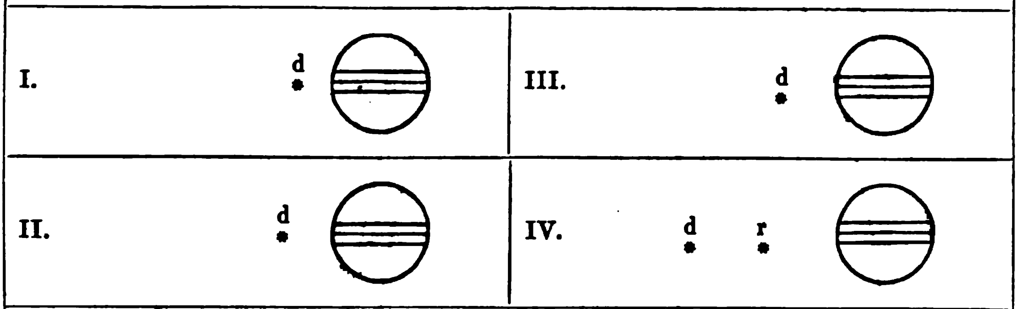
d	h	m	s				d	h	m	s				d	h	m	s			
1	2	16	52.1	I.	Ec.	Dis.	10	20	48		I.	Tr.	In.	21	7	26	21.7	III.	Ec.	Dis.
	5	37		I.	Oc.	Re.		22	13		I.	Sh.	Eg.		10	45		I. *	Sh.	In.
	6	24	0.4	II.	Ec.	Dis.		23	8		I.	Tr.	Eg.		11	26		I. *	Tr.	In.
	11	23		II. *	Oc.	Re.	11	10	30	52.4	IV.*	Ec.	Dis.		13	5		I. *	Sh.	Eg.
	23	32		I.	Sh.	In.		14	35	14.4	IV.*	Ec.	Re.		13	43		III.*	Oc.	Re.
2	0	34		I.	Tr.	In.		17	6	52.9	I. *	Ec.	Dis.		13	46		I. *	Tr.	Eg.
	1	52		I.	Sh.	Eg.		18	43		IV.	Oc.	Dis.	22	7	57	6.1	I. *	Ec.	Dis.
	2	54		I.	Tr.	Eg.		20	17		I.	Oc.	Re.		10	55		I. *	Oc.	Re.
	20	45	10.4	I.	Ec.	Dis.		22	18	44.4	II.	Ec.	Dis.		14	12	30.4	II. *	Ec.	Dis.
3	0	3		I.	Oc.	Re.		23	13		IV.	Oc.	Re.		18	26		II. *	Oc.	Re.
	0	44		II.	Sh.	In.	12	2	57		II.	Oc.	Re.	23	5	14		I.	Sh.	In.
	0	49		IV.	Sh.	In.		14	23		I. *	Sh.	In.		5	53		I.	Tr.	In.
	2	47		II.	Tr.	In.		15	15		I. *	Tr.	In.		7	34		I. *	Sh.	Eg.
	3	37		II.	Sh.	Eg.		16	42		I. *	Sh.	Eg.		8	13		I. *	Tr.	Eg.
	4	57		IV.	Sh.	Eg.		17	34		I. *	Tr.	Eg.	24	2	25	28.6	I.	Ec.	Dis.
	5	41		II.	Tr.	Eg.	13	11	35	12.6	I. *	Ec.	Dis.		5	21		I.	Oc.	Re.
	9	30		III.*	Sh.	In.		14	43		I. *	Oc.	Re.		8	25		II. *	Sh.	In.
	10	14		IV.*	Tr.	In.		16	34		II. *	Sh.	In.		9	41		II. *	Tr.	In.
	12	59		III.*	Sh.	Eg.		18	16		II. *	Tr.	In.		11	19		II. *	Sh.	Eg.
	13	31		III.*	Tr.	In.		19	28		II.	Sh.	Eg.		12	35		II. *	Tr.	Eg.
	14	42		IV.*	Tr.	Eg.		21	10		II.	Tr.	Eg.		21	24		III.	Sh.	In.
	17	6		III.*	Tr.	Eg.	14	3	27	57.9	III.	Ec.	Dis.		23	43		I.	Sh.	In.
	18	0		I. *	Sh.	In.		8	51		I. *	Sh.	In.		23	51		III.	Tr.	In.
	19	1		I.	Tr.	In.		9	41		I. *	Tr.	In.	25	0	19		I.	Tr.	In.
	20	20		I.	Sh.	Eg.		10	18		III.*	Oc.	Re.		0	55		III.	Sh.	Eg.
	21	21		I.	Tr.	Eg.		11	10		I. *	Sh.	Eg.		2	3		I.	Sh.	Eg.
4	15	13	31.8	I. *	Ec.	Dis.		12	0		I. *	Tr.	Eg.		2	39		I.	Tr.	Eg.
	18	30		I. *	Oc.	Re.	15	6	3	34.6	I.	Ec.	Dis.		3	26		III.	Tr.	Eg.
	19	42	35.2	II.	Ec.	Dis.		9	10		I. *	Oc.	Re.		20	53	55.7	I.	Ec.	Dis.
5	0	35		II.	Oc.	Re.		11	36	22.1	II. *	Ec.	Dis.		23	47		I.	Oc.	Re.
	12	29		I. *	Sh.	In.		16	7		II. *	Oc.	Re.	26	3	30	57.5	II.	Ec.	Dis.
	13	28		I. *	Tr.	In.	16	3	20		I.	Sh.	In.		7	34		II. *	Oc.	Re.
	14	48		I. *	Sh.	Eg.		4	7		I.	Tr.	In.		18	11		I. *	Sh.	In.
	15	48		I. *	Tr.	Eg.		5	39		I.	Sh.	Eg.		18	45		I. *	Tr.	In.
6	9	41	50.0	I. *	Ec.	Dis.		6	27		I.	Tr.	Eg.		20	31		I.	Sh.	Eg.
	12	57		I. *	Oc.	Re.	17	0	31	55.6	I.	Ec.	Dis.		21	5		I.	Tr.	Eg.
	14	1		II. *	Sh.	In.		3	36		I.	Oc.	Re.	27	15	22	18.9	I. *	Ec.	Dis.
	15	57		II. *	Tr.	In.		5	51		II.	Sh.	In.		18	13		I. *	Oc.	Re.
	16	54		II. *	Sh.	Eg.		7	25		II.	Tr.	In.		21	42		II.	Sh.	In.
	18	51		II.	Tr.	Eg.		8	45		II. *	Sh.	Eg.		22	49		II.	Tr.	In.
	23	29	47.3	III.	Ec.	Dis.		10	19		II. *	Tr.	Eg.	28	0	36		II.	Sh.	Eg.
7	2	50	29.1	III.	Ec.	Re.		17	26		III.*	Sh.	In.		1	43		II.	Tr.	Eg.
	3	14		III.	Oc.	Dis.		20	28		III.	Tr.	In.		4	31	15.7	IV.	Ec.	Dis.
	6	49		III.	Oc.	Re.		20	56		III.	Sh.	Eg.		8	40	55.3	IV.*	Ec.	Re.
	6	57		I.	Sh.	In.		21	48		I.	Sh.	In.		9	30		IV.*	Oc.	Dis.
	7	55		I.	Tr.	In.		22	34		I.	Tr.	In.		11	24	25.5	III.*	Ec.	Dis.
	9	17		I. *	Sh.	Eg.	18	0	3		III.	Tr.	Eg.		12	40		I. *	Sh.	In.
	10	14		I. *	Tr.	Eg.		0	8		I.	Sh.	Eg.		13	11		I. *	Tr.	In.
8	4	10	10.3	I.	Ec.	Dis.		0	53		I.	Tr.	Eg.		14	1		IV.*	Oc.	Re.
	7	24		I.	Oc.	Re.		19	0	20.5	I.	Ec.	Dis.		15	0		I. *	Sh.	Eg.
	9	0	12.2	II. *	Ec.	Dis.		22	2		I.	Oc.	Re.		15	31		I. *	Tr.	Eg.
	13	46		II. *	Oc.	Re.	19	0	54	52.0	II.	Ec.	Dis.		17	3		III.*	Oc.	Re.
9	1	26		I.	Sh.	In.		5	17		II.	Oc.	Re.	29	9	50	44.8	I. *	Ec.	Dis.
	2	21		I.	Tr.	In.		16	17		I. *	Sh.	In.		12	39		I. *	Oc.	Re.
	3	45		I.	Sh.	Eg.		17	0		I. *	Tr.	In.		16	48	37.1	II. *	Ec.	Dis.
	4	41		I.	Tr.	Eg.		18	36		I. *	Sh.	Eg.		20	42		II.	Oc.	Re.
	22	38	29.7	I.	Ec.	Dis.		18	47		IV.*	Sh.	In.	30	7	8		I.	Sh.	In.
10	1	50		I.	Oc.	Re.		19	20		I.	Tr.	Eg.		7	38		I. *	Tr.	In.
	3	17		II.	Sh.	In.		23	1		IV.	Sh.	Eg.		9	28		I. *	Sh.	Eg.
	5	7		II.	Tr.	In.	20	1	26		IV.	Tr.	In.		9	57		I. *	Tr.	Eg.
	6	11		II.	Sh.	Eg.		5	56		IV.	Tr.	Eg.	31	4	19	9.5	I.	Ec.	Dis.
	8	1		II.	Tr.	Eg.		13	28	42.2	I. *	Ec.	Dis.		7	5		I. *	Oc.	Re.
	13	27		III.*	Sh.	In.		16	28		I. *	Oc.	Re.		10	59		II. *	Sh.	In.
	16	57		III.*	Sh.	Eg.		19	8		II.	Sh.	In.		11	56		II. *	Tr.	In.
	17	1		III.*	Tr.	In.		20	33		II.	Tr.	In.		13	53		II. *	Sh.	Eg.
	19	54		I.	Sh.	In.		22	2		II.	Sh.	Eg.		14	50		II. *	Tr.	Eg.
	20	37		III.	Tr.	Eg.		23	27		II.	Tr.	Eg.							

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

DECEMBER.

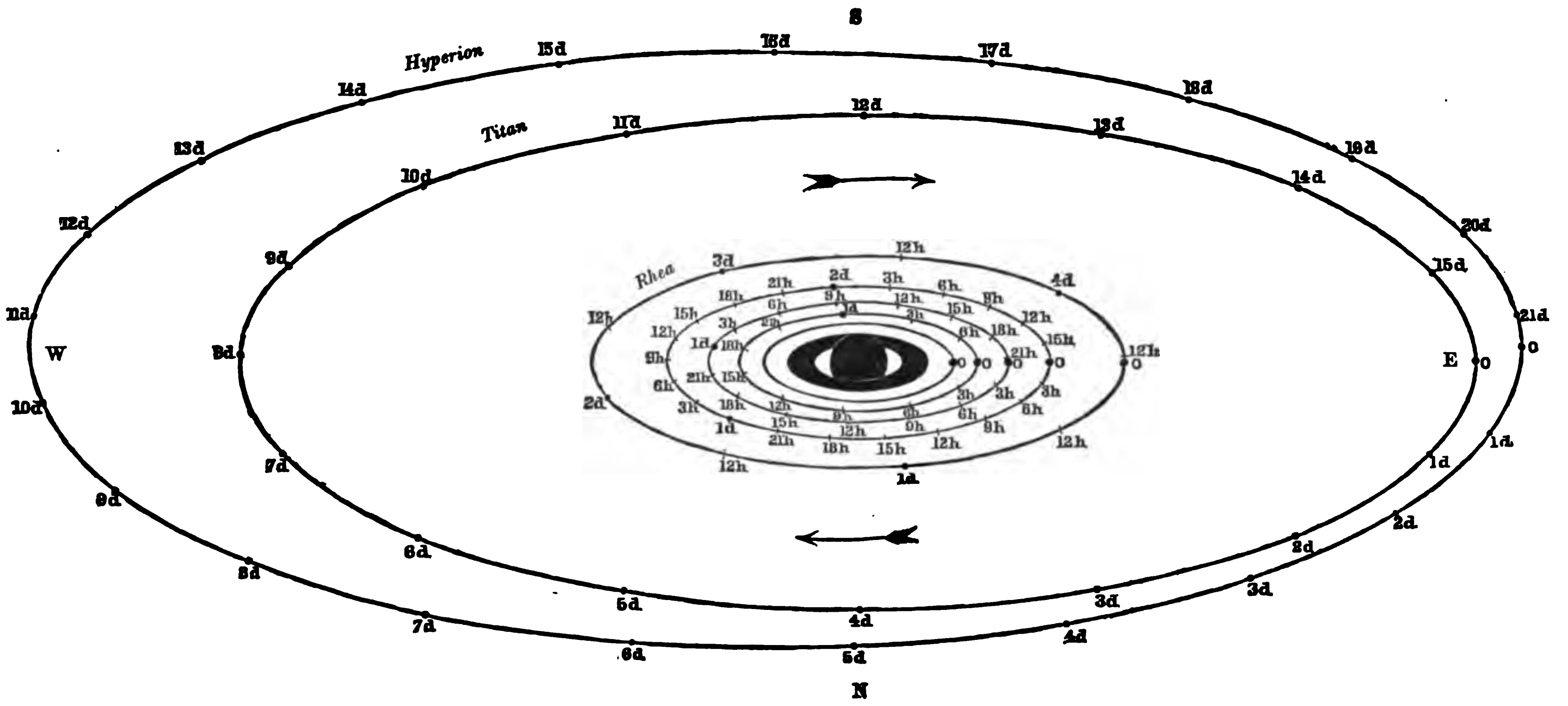
Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13ʰ for an Inverting Telescope.

Day.	West.		East.
1		○	·2 ·1 ·3 4·
2	·1	○	2· 4· 3·
3	○ 4· 2·	3○·	1·
4	3· 4· ·2 ·1	○	
5	4· ·3	1○·	·2
6	4· ·3	○	·12·
7	4· 2· 1·	○	·3
8	·4	⊙	·1 ·3 ·2 ●
9	·4 1·	○	2· 3·
10	·4 2·	○	3· 1·
11	3· ·2 ·1	○	·4 ●
12	3·	○	1· ·2 ·4
13	·3	○	2· ·4 ·1 ●
14	2· 1·	○	·3 ·4
15		○	·1 ·3 ·4 ·2 ●
16	1·	○	2· 3· 4·
17	2·	○	3· ·1 4·
18	3· ·2 ·1	○	4·
19	3·	○	1· 4· ·2
20	·3 4· ·1	○	2·
21	○ 1· 4· 2·	○	·3 ●
22	4· ·2	○	·1 ·3
23	4· 1·	○	·2 3·
24	·4 2·	○	3· ·1
25	·4 ·2 3··1	○	
26	·4 3·	○	1· ·2
27	·3 ·4 ·1	○	2·
28	2·	1○·	·3 ● ·4 ●
29	·2	○	·1 ·3 ·4
30	1·	○	·2 3· ·4
31	○ 2·	○	· 13 · ·4

EPH 83—29—14



Names of the Satellites.	
I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Japetus.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN
DURING THE YEARS 1882 AND 1883,
AS SEEN IN AN INVERTING TELESCOPE.

Mean Synodic Periods.	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.8
VIII.	79	22.0

WASHINGTON MEAN TIMES OF ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The apparent positions of a satellite at any time may be marked on the diagram by counting around the orbit the interval in days and hours which has elapsed since the last east elongation. The times of these elongations may be found from the following tables. Mimas can be seen only within a few hours of each elongation: the time of every elongation visible at Washington is therefore given. The times of other elongations of any satellite in the same direction may be found by adding or subtracting any multiple of the period. For the three outer satellites the times of elongation and conjunction are given. The following abbreviations are used:—

E.,	East Elongation,
I.,	Inferior Conjunction (north of planet),
W.,	West Elongation,
S.,	Superior Conjunction (south of planet).

MIMAS.

Elongations Visible at Washington.

d	h		d	h		d	h		d	h		d	h		d	h	
Jan. 1	9.1	E.	Feb. 3	8.6	E.	Mar.15	10.1	W.	Oct. 3	15.2	E.	Nov. 5	14.7	E.	Dec. 2	11.2	W.
2	7.7	E.	4	7.2	E.	16	8.7	W.	4	13.8	E.	6	13.3	E.	3	9.8	W.
3	6.3	E.	5	5.8	E.	17	7.3	W.	5	12.4	E.	7	11.9	E.	4	8.4	W.
4	4.9	E.	9	10.6	W.	18	5.9	W.	6	11.0	E.	8	10.5	E.	5	6.9	W.
8	10.7	W.	10	9.2	W.				11	15.4	W.	9	9.1	E.	9	12.9	E.
9	9.3	W.	11	7.8	W.	Aug.31	15.5	E.	12	14.0	W.	13	15.0	W.	10	11.5	E.
10	7.8	W.	12	6.4	W.	Sept. 1	14.1	E.	13	12.6	W.	14	13.6	W.	11	10.1	E.
11	6.4	W.	18	10.6	E.	2	12.7	E.	14	11.2	W.	15	12.2	W.	12	8.7	E.
12	5.0	W.	19	9.2	E.	8	15.8	W.	19	15.6	E.	16	10.7	W.	13	7.3	E.
16	10.9	E.	20	7.8	E.	9	14.4	W.	20	14.2	E.	17	9.3	W.	14	5.9	E.
17	9.5	E.	21	6.4	E.	10	13.0	W.	21	12.8	E.	18	7.9	W.	18	11.7	W.
18	8.2	E.	27	9.6	W.	16	16.1	E.	22	11.4	E.	22	13.8	E.	19	10.4	W.
19	6.8	E.	28	8.2	W.	17	14.7	E.	23	10.0	E.	23	12.4	E.	20	9.0	W.
20	5.4	E.	Mar. 1	6.8	W.	18	13.3	E.	27	15.8	W.	24	11.0	E.	21	7.6	W.
25	9.8	W.	2	5.4	W.	19	11.9	E.	28	14.4	W.	25	9.6	E.	22	6.2	W.
26	8.4	W.	7	9.9	E.	24	16.3	W.	29	13.0	W.	26	8.3	E.	27	10.5	E.
27	7.0	W.	8	8.5	E.	25	14.9	W.	30	11.6	W.	27	6.9	E.	28	9.1	E.
28	5.6	W.	9	7.1	E.	26	13.5	W.	31	10.2	W.	30	14.0	W.	29	7.7	E.
Feb. 2	10.0	E.	10	5.7	E.	27	12.1	W.	Nov. 1	8.8	W.	Dec. 1	12.6	W.	30	6.3	E.

ENCELADUS.

d	h		d	h		d	h		d	h		d	h		d	h	
Jan. 1	12.2	E.	Jan.15	5.0	E.	Jan.28	21.9	E.	Feb.11	14.7	E.	Feb.25	7.6	E.	Mar.11	0.6	E.
2	21.1	E.	16	13.9	E.	30	6.8	E.	12	23.6	E.	26	16.5	E.	12	9.5	E.
4	5.9	E.	17	22.8	E.	31	15.7	E.	14	8.5	E.	28	1.4	E.	13	18.4	E.
5	14.7	E.	19	7.7	E.	Feb. 2	0.5	E.	15	17.4	E.	Mar. 1	10.3	E.	15	3.3	E.
6	23.6	E.	20	16.6	E.	3	9.4	E.	17	2.3	E.	2	19.2	E.	16	12.2	E.
8	8.5	E.	22	1.5	E.	4	18.3	E.	18	11.2	E.	4	4.1	E.	17	21.1	E.
9	17.4	E.	23	10.4	E.	6	3.2	E.	19	20.1	E.	5	13.0	E.	19	6.0	E.
11	2.2	E.	24	19.3	E.	7	12.1	E.	21	5.0	E.	6	21.9	E.			
12	11.1	E.	26	4.1	E.	8	20.9	E.	22	13.8	E.	8	6.7	E.	Aug.30	17.9	E.
13	20.0	E.	27	13.0	E.	10	5.8	E.	23	22.7	E.	9	15.7	E.	Sept. 1	2.8	E.

WASHINGTON MEAN TIMES OF EAST ELONGATIONS.

ENCELADUS—(*Concluded.*)

	d	h		d	h		d	h		d	h		d	h		d	h
Sept.	2	11.7 E.	Sept.	23	1.0 E.	Oct.	13	14.2 E.	Nov.	3	3.5 E.	Nov.	23	16.6 E.	Dec.	14	5.6 E.
	3	20.6 E.		24	9.9 E.		14	23.1 E.		4	12.4 E.		25	1.5 E.		15	14.5 E.
	5	5.5 E.		25	18.8 E.		16	8.0 E.		5	21.3 E.		26	10.4 E.		16	23.4 E.
	6	14.4 E.		27	3.7 E.		17	16.9 E.		7	6.2 E.		27	19.3 E.		18	8.3 E.
	7	23.3 E.		28	12.6 E.		19	1.8 E.		8	15.0 E.		29	4.1 E.		19	17.2 E.
	9	8.1 E.		29	21.4 E.		20	10.6 E.		9	23.8 E.		30	12.9 E.		21	2.0 E.
	10	17.0 E.	Oct.	1	6.3 E.		21	19.5 E.		11	8.7 E.	Dec.	1	21.8 E.		22	10.9 E.
	12	1.9 E.		2	15.2 E.		23	4.4 E.		12	17.6 E.		3	6.7 E.		23	19.8 E.
	13	10.8 E.		4	0.1 E.		24	13.3 E.		14	2.5 E.		4	15.6 E.		25	4.7 E.
	14	19.7 E.		5	9.0 E.		25	22.2 E.		15	11.4 E.		6	0.4 E.		26	13.6 E.
	16	4.5 E.		6	17.9 E.		27	7.1 E.		16	20.2 E.		7	9.2 E.		27	22.5 E.
	17	13.4 E.		8	2.8 E.		28	16.0 E.		18	5.1 E.		8	18.1 E.		29	7.4 E.
	18	22.3 E.		9	11.7 E.		30	0.9 E.		19	14.0 E.		10	3.0 E.		30	16.3 E.
	20	7.2 E.		10	20.6 E.		31	9.8 E.		20	22.9 E.		11	11.9 E.	1884		
	21	16.1 E.		12	5.4 E.	Nov.	1	18.7 E.		22	7.8 E.		12	20.8 E.	Jan.	1	1.2 E.

TETHYS.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	0	12.8 E.	Feb.	7	7.0 E.	Mar.	17	1.2 E.	Sept.	21	22.5 E.	Oct.	29	16.5 E.	Dec.	6	10.3 E.
	2	10.1 E.		9	4.3 E.		18	22.4 E.		23	19.8 E.		31	13.8 E.		8	7.6 E.
	4	7.4 E.		11	1.6 E.		20	19.7 E.		25	17.1 E.	Nov.	2	11.1 E.		10	4.9 E.
	6	4.7 E.		12	22.9 E.		22	17.0 E.		27	14.4 E.		4	8.4 E.		12	2.2 E.
	8	2.0 E.		14	20.3 E.		24	14.3 E.		29	11.7 E.		6	5.7 E.		13	23.4 E.
	9	23.3 E.		16	17.6 E.				Oct.	1	9.0 E.		8	3.0 E.		15	20.7 E.
	11	20.6 E.		18	14.9 E.	Aug.	26	12.2 E.		3	6.3 E.		10	0.3 E.		17	18.0 E.
	13	17.9 E.		20	12.2 E.		28	9.5 E.		5	3.6 E.		11	21.6 E.		19	15.3 E.
	15	15.2 E.		22	9.5 E.		30	6.8 E.		7	0.9 E.		13	18.8 E.		21	12.5 E.
	17	12.6 E.		24	6.8 E.	Sept.	1	4.1 E.		8	22.2 E.		15	16.1 E.		23	9.8 E.
	19	9.9 E.		26	4.1 E.		3	1.4 E.		10	19.5 E.		17	13.4 E.		25	7.1 E.
	21	7.2 E.		28	1.4 E.		4	22.7 E.		12	16.8 E.		19	10.7 E.		27	4.4 E.
	23	4.5 E.	Mar.	1	22.8 E.		6	20.1 E.		14	14.1 E.		21	8.0 E.		29	1.8 E.
	25	1.8 E.		3	20.1 E.		8	17.4 E.		16	11.4 E.		23	5.3 E.		30	23.1 E.
	26	23.2 E.		5	17.4 E.		10	14.7 E.		18	8.7 E.		25	2.6 E.	1884		
	28	20.5 E.		7	14.7 E.		12	12.0 E.		20	6.0 E.		26	23.9 E.	Jan.	1	20.4 E.
	30	17.7 E.		9	12.0 E.		14	9.3 E.		22	3.3 E.		28	21.1 E.		3	17.7 E.
Feb.	1	15.0 E.		11	9.2 E.		16	6.6 E.		24	0.6 E.		30	18.4 E.		5	15.0 E.
	3	12.3 E.		13	6.5 E.		18	3.9 E.		25	21.9 E.	Dec.	2	15.7 E.			
	5	9.6 E.		15	3.8 E.		20	1.2 E.		27	19.2 E.		4	13.0 E.			

DIONE.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	0.9 E.	Feb.	2	21.1 E.	Mar.	7	17.5 E.	Sept.	26	10.2 E.	Oct.	29	6.1 E.	Dec.	1	1.9 E.
	3	18.6 E.		5	14.7 E.					29	3.8 E.		31	23.7 E.		3	19.5 E.
	6	12.3 E.		8	8.4 E.	Aug.	30	1.1 E.	Oct.	1	21.5 E.	Nov.	3	17.4 E.		6	13.2 E.
	9	5.9 E.		11	2.2 E.	Sept.	1	18.8 E.		4	15.1 E.		6	11.0 E.		9	6.7 E.
	11	23.6 E.		13	19.9 E.		4	12.5 E.		7	8.8 E.		9	4.7 E.		12	0.4 E.
	14	17.3 E.		16	13.6 E.		7	6.2 E.		10	2.5 E.		11	22.3 E.		14	18.0 E.
	17	11.0 E.		19	7.3 E.		9	23.9 E.		12	20.2 E.		14	16.0 E.		17	11.7 E.
	20	4.6 E.		22	1.0 E.		12	17.6 E.		15	13.8 E.		17	9.6 E.		20	5.3 E.
	22	22.4 E.		24	18.7 E.		15	11.3 E.		18	7.5 E.		20	3.3 E.		22	23.0 E.
	25	16.0 E.		27	12.5 E.		18	5.0 E.		21	1.1 E.		22	20.9 E.		25	16.7 E.
	28	9.7 E.	Mar.	2	6.1 E.		20	22.7 E.		23	18.8 E.		25	14.6 E.		28	10.3 E.
	31	3.4 E.		4	23.8 E.		23	16.5 E.		26	12.4 E.		28	8.2 E.		31	4.0 E.

RHEA.				TITAN.				HYPERION.			
d	h	d	h	d	h	d	h	d	h	d	h
Jan. 2	4.2 E.	Sep. 25	23.6 E.	Jan. 0	4.3 E.	Sep. 29	4.5 E.	Jan. 0	0.8 I.	Sep. 13	18.4 I.
6	16.6 E.	30	12.0 E.	4	3.8 I.	Oct. 3	4.1 I.	5	8.8 W.	19	1.9 W.
11	5.1 E.	Oct. 5	0.4 E.	8	3.3 W.	7	3.7 W.	10	16.8 S.	24	9.5 S.
15	17.5 E.	9	12.8 E.	12	2.9 S.	11	3.1 S.	16	0.9 E.	29	17.0 E.
20	5.9 E.	14	1.1 E.	16	2.4 E.	15	2.5 E.	21	9.0 I.	Oct. 5	0.6 I.
24	18.4 E.	18	13.5 E.	20	2.0 I.	19	2.1 I.	26	17.2 W.	10	8.0 W.
29	6.8 E.	23	1.8 E.	24	1.6 W.	23	1.7 W.	Feb. 1	0.5 S.	15	15.5 S.
Feb. 2	19.3 E.	27	14.1 E.	28	1.4 S.	27	1.3 S.	6	8.7 E.	20	22.9 E.
7	7.8 E.	Nov. 1	2.4 E.	Feb. 1	1.2 E.	31	0.7 E.	11	16.7 I.	26	6.2 I.
11	20.2 E.	5	14.8 E.	5	1.1 I.	Nov. 4	0.1 I.	17	0.8 W.	31	13.5 W.
16	8.6 E.	10	3.1 E.	9	1.1 W.	7	23.4 W.	22	8.9 S.	Nov. 5	20.8 S.
20	21.0 E.	14	15.4 E.	13	1.0 S.	11	22.8 S.	27	17.0 E.	11	4.0 E.
25	9.6 E.	19	3.8 E.	17	0.9 E.	15	22.1 E.	Mar. 5	1.2 I.	16	11.2 I.
Mar. 1	22.2 E.	23	16.1 E.	21	0.8 I.	19	21.4 I.	10	9.5 W.	21	18.4 W.
6	10.8 E.	28	4.4 E.	25	0.8 W.	23	20.7 W.	15	17.6 S.	27	1.6 S.
10	23.2 E.	Dec. 2	16.7 E.	Mar. 1	0.8 S.	27	20.0 S.	21	1.7 E.	Dec. 2	8.7 E.
15	11.8 E.	7	5.0 E.			Dec. 1	19.2 E.	26	9.8 I.	7	15.8 I.
		11	17.2 E.	Sept. 1	6.9 I.	5	18.5 I.	31	17.8 W.	12	22.9 W.
Aug. 29	20.9 E.	16	5.5 E.	5	6.6 W.	9	17.7 W.			18	6.1 S.
Sept. 3	9.3 E.	20	17.9 E.	9	6.3 S.	13	17.1 S.	Aug. 18	2.9 E.	23	13.2 E.
7	21.8 E.	25	6.2 E.	13	6.1 E.	17	16.6 E.	23	10.9 I.	28	20.3 I.
12	10.2 E.	29	18.6 E.	17	5.7 I.	21	16.1 I.	28	18.8 W.	1884	
16	22.7 E.	1884		21	5.3 W.	25	15.6 W.	Sept. 3	2.7 S.	Jan. 3	3.4 W.
21	11.2 E.	Jan. 3	6.9 E.	25	4.8 S.	29	15.2 S.	8	10.6 E.	8	10.5 S.

JAPETUS	West Elongation . .	January 6	June 19	September 7	November 25
	Superior Conjunction .	January 26	July 9	September 26	December 14
	East Elongation . .	February 16	July 29	October 16	December 33
	Inferior Conjunction .	March 8	August 18	November 5	

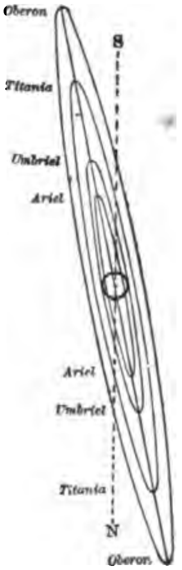
THE APPARENT ELEMENTS OF SATURN'S RINGS.

Greenwich Mean Noon.	*a* Outer Major Axis.	*b* Outer Minor Axis.	*p* Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East.	*l* The Elevation of the Earth above the Plane of the Ring.	*l′* The Elevation of the Sun above the Plane of the Ring.	*u* Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on	*u′*
						Equator.	Ecliptic.
Jan. 0	44″.31	16″.85	− 1° 30′.0	− 22° 20′.7	− 23° 34′.0	101° 53′.1	59° 10′.4
20	42.85	16.29	1 26.8	22 20.5	23 43.9	101 28.1	58 45.4
Feb. 9	41.31	15.83	1 29.6	22 31.5	23 53.6	101 49.4	59 6.8
Mar. 1	39.88	15.50	1 38.0	22 52.1	24 3.1	102 55.9	60 13.4
21	38.70	15.32	1 51.3	23 19.5	24 12.3	104 40.6	61 58.2
Apr. 10	37.82	15.28	− 2 8.1	− 23 50.2	− 24 21.3	106 54.9	64 12.5
30	37.28	15.37	2 27.5	24 21.2	24 30.0	109 29.8	66 47.5
May 20	37.09	15.57	2 48.0	24 49.7	24 38.6	112 15.8	69 33.6
June 9	37.26	15.88	3 8.3	25 14.1	24 46.8	115 3.6	72 21.5
29	37.77	16.29	3 27.5	25 33.0	24 54.8	117 43.4	75 1.3
July 19	38.61	16.79	− 3 44.2	− 25 46.3	− 25 2.5	120 6.1	77 24.1
Aug. 8	39.76	17.37	3 57.5	25 54.3	25 10.1	122 2.0	79 20.1
28	41.16	18.02	4 6.5	25 57.7	25 17.3	123 21.7	80 39.9
Sept. 17	42.70	18.68	4 10.3	25 57.3	25 24.3	123 57.7	81 15.9
Oct. 7	44.21	19.31	4 9.2	25 53.7	25 31.0	123 45.7	81 4.0
27	45.47	19.79	− 4 2.4	− 25 47.7	− 25 37.5	122 48.1	80 6.5
Nov. 16	46.24	20.03	3 51.9	25 39.9	25 43.8	121 15.6	78 34.1
Dec. 6	46.33	19.96	3 39.5	25 31.3	25 49.9	119 28.0	76 46.6
26	45.72	19.62	3 28.0	25 24.3	25 55.3	117 49.4	75 8.1
31	45.48	19.49	− 3 25.5	− 25 22.9	− 25 56.7	117 28.8	74 47.6

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring = 0.8801 log factor = 9.9445
The outer ellipse of the inner ring = 0.8599 log factor = 9.9344
The inner ellipse of the inner ring = 0.6650 log factor = 9.8228
The inner ellipse of the dusky ring = 0.5486 log factor = 9.7392

NOTE.—The negative sign of *l* indicates that the visible surface of the ring is the southern one.



APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1883,

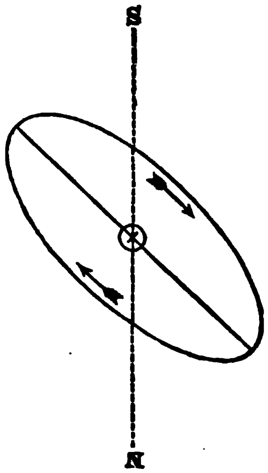
AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIMES OF ELONGATIONS.

ARIEL.						UMBRIEL.						TITANIA.						OBERON.			
North.			South.			North.			South.			North.			South.			North and South.			
	d	h		d	h		d	h		d	h		d	h		d	h		d	h	
Jan.	0	2.8	Jan.	1	8.9	Jan.	1	12.0	Jan.	3	13.7	Jan.	1	0.1	Jan.	5	8.5	Jan.	5	10.5	N.
	7	16.3		8	22.5		9	18.9		11	20.6		9	17.0		14	1.5		12	4.1	S.
	15	5.7		16	11.9		18	1.8		20	3.5		18	10.0		22	18.4		18	21.6	N.
	22	19.2		24	1.4		26	8.7		28	10.5		27	2.9		31	11.4		25	15.2	S.
	30	8.7		31	14.8	Feb.	3	15.6	Feb.	5	17.4	Feb.	4	19.8	Feb.	9	4.3	Feb.	1	8.8	N.
Feb.	6	22.1	Feb.	8	4.3		11	22.6		14	0.3		13	12.8		17	21.2		8	2.3	S.
	14	11.6		15	17.8		20	5.5		22	7.2		22	5.7		26	14.2		14	19.9	N.
	22	1.1		23	7.2		28	12.4	Mar.	2	14.1	Mar.	2	22.6	Mar.	7	7.1		21	13.4	S.
Mar.	1	14.5	Mar.	2	20.7	Mar.	8	19.3		10	21.1		11	15.6		16	0.0		28	7.0	N.
	9	4.0		10	10.2		17	2.2		19	4.0		20	8.5		24	16.9	Mar.	7	0.5	S.
	16	17.5		17	23.7		25	9.2		27	10.9		29	1.4	Apr.	2	9.9		13	18.1	N.
	24	6.9		25	13.1	Apr.	2	16.1	Apr.	4	17.8	Apr.	6	18.4		11	2.8		20	11.6	S.
	31	20.4	Apr.	2	2.6		10	23.0		13	0.7		15	11.3		19	19.7		27	5.2	N.
Apr.	8	9.8		9	16.0		19	5.9		21	7.7		24	4.3		28	12.7	Apr.	2	22.7	S.
	15	23.3		17	5.5		27	12.8		29	14.6	May	2	21.2	May	7	5.7		9	16.3	N.
	23	12.7		24	18.9	May	5	19.7	May	7	21.5		11	14.2		15	22.6		16	9.8	S.
May	1	2.2	May	2	8.4		14	2.7		16	4.4		20	7.1		24	15.6		23	3.4	N.
	8	15.7		9	21.9		22	9.6		24	11.3		29	0.1	June	2	8.5		29	21.0	S.
	16	5.2		17	11.3		30	16.5	June	1	18.3	June	6	17.0		11	1.5	May	6	14.6	N.
	23	18.6		25	0.8	June	7	23.4		10	1.2		15	10.0		19	18.4		13	8.1	S.
	31	8.1	June	1	14.3		16	6.4		18	8.1		24	2.9		28	11.3		20	1.7	N.
Dec.	8	21.4	Dec.	7	15.2	Nov.	29	0.9	Dec.	1	2.6	Nov.	27	20.0	Dec.	2	4.4	Dec.	8	0.6	N.
	16	10.9		15	4.7	Dec.	7	7.8		9	9.6	Dec.	6	12.9		10	21.4		14	18.1	S.
	24	0.4		22	18.1		15	14.7		17	16.5		15	5.9		19	14.3		21	11.7	N.
	31	13.8		30	7.6		23	21.7		25	23.4		23	22.8		28	7.2		28	5.2	S.

	d	h		d	h
Period of Ariel,	2	12.489	Period of Titania,	8	16.942
Period of Umbriel,	4	3.460	Period of Oberon,	13	11.119

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1883,

AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIMES OF ELONGATIONS.

South West.			North East.			South West.			North East.			South West.			North East.		
	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	0	12.4	Jan.	3	10.9	Aug.	23	14.2	Aug.	26	12.7	Oct.	27	5.7	Oct.	30	4.2
	6	9.4		9	8.0		29	11.2	Sept.	1	9.8	Nov.	2	2.7	Nov.	5	1.2
	12	6.5		15	5.0	Sept.	4	8.3		7	6.8		7	23.8		10	22.3
	18	3.5		21	2.1		10	5.3		13	3.8		13	20.8		16	19.3
	24	0.6		26	23.1		16	2.4		19	0.9		19	17.9		22	16.4
	29	21.6	Feb.	1	20.2		21	23.4		24	21.9		25	14.9		28	13.4
Feb.	4	18.7		7	17.2		27	20.5		30	19.0	Dec.	1	12.0	Dec.	4	10.5
	10	15.7		13	14.2	Oct.	3	17.5	Oct.	6	16.0		7	9.0		10	7.5
	16	12.8		19	11.3		9	14.5		12	13.1		13	6.0		16	4.6
	22	9.8		25	8.3		15	11.6		18	10.1		19	3.1		22	1.6
	28	6.9	Mar.	3	5.4		21	8.6		24	7.2		25	0.1		27	22.7

The above times are those of each passage of the satellite through an apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, remembering that the radius vector of the satellite describes equal areas in equal times.

Period of the satellite of Neptune, $5^d\ 21^h.045$.

In the above diagrams, the central circle represents the planet, and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m			°	'
Jan.	2	8	–	☿	greatest Hel. Lat. S.		
	5	14	37	☌ ♀ ☾	.... ♀ +	3	5
	7	23	18	☌ ♂ ☾	.... ♂ —	4	49
	9	1	–	♀	Perihelion.		
	9	18	24	☌ ☿ ☾	.... ☿ —	6	59
	9	–	–	♀	at greatest brilliancy.		
	16	19	59	☌ ♆ ☾	.... ♆ —	2	0
	17	1	37	☌ ♄ ☾	.... ♄ —	2	7
	19	11	17	☌ ♃ ☾	.... ♃ +	2	35
	19	11	–	☌ ♀	η Ophiuchi. * +	2	21
	19	18	–	♄	Stationary.		
	21	9	–	☿	in ☊		
	21	14	–	☿	greatest elong. E.	18	32
	25	14	–	♆	Stationary.		
	25	23	–	☿	Perihelion.		
	26	19	39	☌ ⛢ ☾	.... ⛢ +	5	8
	27	8	–	☿	Stationary.		
	31	4	–	♀	greatest Hel. Lat. N.		
Feb.	3	12	27	☌ ♀ ☾	.... ♀ +	0	44
	4	11	–	□ ♆ ☉			
	5	6	–	☿	greatest Hel. Lat. N.		
	5	6	–	☌ ☿ ☉	Inferior.		
	6	1	25	☌ ♂ ☾	.... ♂ —	6	4
	6	19	35	☌ ☿ ☾	.... ☿ —	1	22
	7	18	–	□ ♄ ☉			
	12	18	–	☌ ☿ ♂	.... ☿ +	4	23
	13	1	29	☌ ♆ ☾	.... ♆ —	1	41
	13	7	49	☌ ♄ ☾	.... ♄ —	1	40
	14	13	–	♃	Stationary.		
	15	14	–	♀	greatest elong. W.	46	52
	15	14	44	☌ ♃ ☾	.... ♃ +	2	48
	17	12	–	☿	Stationary.		
	19	17	–	☌ ♀	π Sagittarii. * —	1	30
	23	0	52	☌ ⛢ ☾	.... ⛢ +	5	5
	28	17	–	☿	in ☋		
Mar.	3	0	–	☿	greatest elong. W.	27	10
	5	4	25	☌ ♀ ☾	.... ♀ —	3	13
	6	16	38	☌ ☿ ☾	.... ☿ —	6	18
	7	2	43	☌ ♂ ☾	.... ♂ —	6	26
	9	1	–	☌ ☿	δ Capricorni * —	1	24
	10	22	–	☿	Aphelion.		
	11	12	–	☍ ⛢ ☉			
	12	9	39	☌ ♆ ☾	.... ♆ —	1	23
	12	17	56	☌ ♄ ☾	.... ♄ —	1	9
	12	21	–	□ ♃ ☉			
	14	22	58	☌ ♃ ☾	.... ♃ +	3	12
	17	0	–	☌ ☿ ♂	.... ☿ —	0	57
	19	23	–	♂	greatest Hel. Lat. S.		
	20	6	–	☉	enters ♈, Spring com.		
	22	4	56	☌ ⛢ ☾	.... ⛢ +	5	7
	26	0	–	♀	Stationary.		
	26	8	–	☌ ♀	δ Capricorni * —	2	52
	28	6	–	♀	in ☋		

	d	h	m			°	'
Mar.	31	8	–	☿	greatest Hel. Lat. S.		
Apr.	4	0	53	☌ ♀ ☾	.... ♀ —	5	38
	5	2	2	☌ ♂ ☾	.... ♂ —	5	39
	6	7	15	☌ ☿ ☾	.... ☿ —	5	3
	8	20	47	☌ ♆ ☾	.... ♆ —	1	10
	9	7	56	☌ ♄ ☾	.... ♄ —	0	41
	9	23	–	☌ ♀	λ Aquarii. . * +	0	26
	11	12	52	☌ ♃ ☾	.... ♃ +	3	38
	12	22	–	♂	Perihelion.		
	15	18	–	☌ ☿ ☉	Superior.		
	18	8	58	☌ ⛢ ☾	.... ⛢ +	5	14
	19	8	–	☿	in ☊		
	21	–	–	☾	eclipsed, invis. at Wash.		
	23	22	–	☿	Perihelion.		
	26	15	–	☌ ☿ ♆	.... ☿ +	3	7
May	1	11	–	☌ ☿ ♄	.... ☿ +	3	54
	1	11	–	♀	Aphelion.		
	3	18	51	☌ ♀ ☾	.... ♀ —	4	52
	3	22	52	☌ ♂ ☾	.... ♂ —	3	58
	4	5	–	☿	greatest Hel. Lat. N.		
	6	–	–	☉	eclipsed, invis. at Wash.		
	6	9	12	☌ ♆ ☾	.... ♆ —	1	4
	7	0	1	☌ ♄ ☾	.... ♄ —	0	18
	7	14	54	☌ ☿ ☾	.... ☿ +	4	49
	8	20	–	☌ ♆ ☉			
	9	7	5	☌ ♃ ☾	.... ♃ +	4	1
	9	13	–	☌ ♀ ♂	.... ♀ —	0	48
	13	19	–	☿	greatest elong. E.	21	55
	15	14	19	☌ ⛢ ☾	.... ⛢ +	5	16
	18	11	–	♃	in ☊		
	20	6	–	☌ ♄ ☉			
	22	15	–	☌ ♃	μ Gemino um * —	0	50
	24	2	–	♀	greatest Hel. Lat. S.		
	26	0	–	☿	Stationary.		
	26	19	–	⛢	Stationary.		
	27	17	–	☿	in ☋		
June	1	17	30	☌ ♂ ☾	.... ♂ +	1	43
	2	10	55	☌ ♀ ☾	.... ♀ —	1	31
	2	20	47	☌ ♆ ☾	.... ♆ —	0	58
	3	15	55	☌ ♄ ☾	.... ♄ +	0	2
	4	19	59	☌ ☿ ☾	.... ☿ +	0	52
	6	3	27	☌ ♃ ☾	.... ♃ +	4	21
	6	21	–	☿	Aphelion.		
	7	11	–	☌ ☿ ☉	Inferior.		
	7	20	–	☌ ♆ ♀	.... ♆ —	0	10
	9	13	–	□ ⛢ ☉			
	11	21	45	☌ ⛢ ☾	.... ⛢ +	5	7
	19	7	–	☌ ♄ ♀	.... ♄ —	0	35
	19	8	–	☿	Stationary.		
	21	2	–	☉	enters ♋, Summer com.		
	26	11	–	☌ ♂ ♆	.... ♂ +	1	7
	27	7	–	☿	greatest Hel. Lat. S.		
	30	10	33	☌ ♂ ☾	.... ♂ +	0	37

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		°	′
July	1	5	53	☌ ♄ ☾ .... ♄ +	0	22
	1	14	-	☿ greatest elong. W.	21	39
	2	5	58	☌ ♀ ☾ .... ♀ +	2	31
	2	6	26	☌ ☿ ☾ .... ☿ +	0	17
	3	0	-	☉ Apogee.		
	3	11	-	☌ ☿ ♀ .... ☿ —	2	3
	3	23	50	☌ ♃ ☾ .... ♃ +	4	38
	4	22	-	☌ ♃ ☉		
	7	23	-	☌ ☿ ♀ .... ☿ —	1	18
	9	7	5	☌ ⛢ ☾ .... ⛢ +	4	50
	16	7	-	☿ in ☊		
	19	9	-	♀ in ☊		
	19	16	-	☌ ☿ ♃ .... ☿ +	0	32
	19	20	-	☌ ♂ ♄ .... ♂ +	1	28
	20	21	-	☿ Perihelion.		
	25	20	-	☌ ♀ ♃ .... ♀ +	0	10
	27	12	50	☌ ♆ ☾ .... ♆ —	0	33
	28	17	1	☌ ♄ ☾ .... ♄ +	0	44
	29	2	36	☌ ♂ ☾ .... ♂ +	2	44
	29	6	-	☌ ☿ ☉ Superior.		
	31	4	-	☿ greatest Hel. Lat. N.		
	31	19	10	☌ ♃ ☾ .... ♃ +	4	58
Aug.	1	5	50	☌ ♀ ☾ .... ♀ +	5	34
	2	22	40	☌ ☿ ☾ .... ☿ +	7	0
	5	17	29	☌ ⛢ ☾ .... ⛢ +	4	31
	12	18	-	☌ ♄ α Tauri... * —	3	40
	13	13	-	□ ♆ ☉		
	14	9	-	♂ in ☊		
	21	17	-	♀ Perihelion.		
	23	16	-	☿ in ☋		
	23	18	30	☌ ♆ ☾ .... ♆ —	0	19
	23	22	-	☌ ⛢ ☿ .... ⛢ +	0	50
	24	4	-	♆ Stationary.		
	25	1	36	☌ ♄ ☾ .... ♄ +	1	3
	26	22	47	☌ ♂ ☾ .... ♂ +	4	30
	28	12	36	☌ ♃ ☾ .... ♃ +	5	17
	29	5	-	☌ ♂ μ Geminorum * —	1	4
	31	14	37	☌ ♀ ☾ .... ♀ +	6	5
Sept.	1	15	-	□ ♄ ☉		
	2	3	58	☌ ⛢ ☾ .... ⛢ +	4	18
	2	21	-	☿ Aphelion.		
	3	4	45	☌ ☿ ☾ .... ☿ +	0	51
	10	15	-	☿ greatest elong. E.	26	49
	12	21	-	♀ greatest Hel. Lat. N.		
	16	7	-	☌ ⛢ ☉		
	16	23	-	☌ ♀ ⛢ .... ♀ +	0	45
	19	21	-	☌ ♂ δ Geminorum * —	0	49
	20	1	2	☌ ♆ ☾ .... ♆ —	0	10
	20	6	-	☌ ♀ ☉ Superior.		
	21	8	51	☌ ♄ ☾ .... ♄ +	1	14
	21	20	-	♄ Stationary.		
	22	16	-	☉ enters ♎, Autumn com.		
	23	6	-	☿ greatest Hel. Lat. S.		
	23	18	-	☿ Stationary.		
Sept.	24	7	32	☌ ♂ ☾ .... ♂ +	5	52
	25	3	28	☌ ♃ ☾ .... ♃ +	5	34
	29	13	14	☌ ⛢ ☾ .... ⛢ +	4	10
	30	21	55	☌ ♀ ☾ .... ♀ +	3	19
Oct.	1	9	36	☌ ☿ ☾ .... ☿ —	2	5
	3	21	-	☌ ☿ ♀ .... ☿ —	4	12
	6	8	-	☌ ☿ ☉ Inferior.		
	12	6	-	☿ in ☊		
	12	19	-	☌ ⛢ β Virginis . * —	0	5
	15	15	-	☿ Stationary.		
	15	-	-	☾ eclipsed, vis. at Wash.		
	16	20	-	☿ Perihelion.		
	17	9	40	☌ ♆ ☾ .... ♆ —	0	9
	18	16	11	☌ ♄ ☾ .... ♄ +	1	13
	19	1	-	☌ ♂ ♃ .... ♂ +	0	59
	20	2	-	☌ ☿ γ Virginis . * +	1	7
	21	22	-	☿ greatest elong. W.	18	22
	22	15	55	☌ ♃ ☾ .... ♃ +	5	45
	22	15	47	☌ ♂ ☾ .... ♂ +	6	49
	24	-	-	♂ in Præsepe.		
	26	22	53	☌ ⛢ ☾ .... ⛢ +	4	5
	27	0	-	□ ♃ ☉		
	27	4	-	☿ greatest Hel. Lat. N.		
	28	21	33	☌ ☿ ☾ .... ☿ +	3	22
	30	-	-	☉ eclipsed, invis. at Wash.		
	31	5	41	☌ ♀ ☾ .... ♀ —	1	13
	31	12	-	□ ♂ ☉		
Nov.	1	12	-	☌ ♄ α Tauri... * —	3	30
	7	23	-	♀ in ☋		
	11	16	-	☍ ♆ ☉		
	13	19	50	☌ ♆ ☾ .... ♆ —	0	15
	15	0	9	☌ ♄ ☾ .... ♄ +	1	2
	19	2	5	☌ ♃ ☾ .... ♃ +	5	47
	19	15	-	☿ in ☋		
	20	0	35	☌ ♂ ☾ .... ♂ +	7	31
	20	22	-	♃ Stationary near Præsepe.		
	23	7	23	☌ ⛢ ☾ .... ⛢ +	3	56
	25	13	-	☌ ☿ ☉ Superior.		
	28	11	-	☍ ♄ ☉		
	29	4	48	☌ ☿ ☾ .... ☿ —	4	11
	29	20	-	☿ Aphelion.		
	30	16	27	☌ ♀ ☾ .... ♀ —	5	9
Dec.	11	5	33	☌ ♆ ☾ .... ♆ —	15	38
	12	2	-	♀ Aphelion.		
	12	7	53	☌ ♄ ☾ .... ♄ +	0	55
	16	9	51	☌ ♃ ☾ .... ♃ +	5	43
	17	20	56	☌ ♂ ☾ .... ♂ +	8	18
	20	2	-	□ ⛢ ☉		
	20	6	-	☿ greatest Hel. Lat. S.		
	20	15	46	☌ ⛢ ☾ .... ⛢ +	3	42
	21	10	-	☉ enters ♑, Winter com.		
	22	13	-	♂ Stationary.		
	30	12	27	☌ ☿ ☾ .... ☿ —	6	50
	31	2	22	☌ ♀ ☾ .... ♀ —	6	51

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Abo	+ 60 26 56.8	− 9 53.5	9.998902	− 6 37 20.3	− 1 29 8.2
Adelaide	− 34 57	+ 10 47.8	9.999526	−14 22 33.1	− 9 14 21.0
Albany	+ 42 39 49.5	− 11 28.2	9.999336	− 0 13 12.87	+ 4 54 59.22
Alfred	+ 42 15 19.8	− 11 27.2	9.999346	+ 0 2 55.00	+ 5 11 7.09
Algier	+ 36 45 2.7	− 11 1.6	9.999483	− 5 20 23.48	− 0 12 11.39
Allegheny	+ 40 27 41.6	− 11 21.6	9.999391	+ 0 11 50.84	+ 5 20 2.93
Altona	+ 53 32 45.3	− 11 0.8	9.999063	− 5 47 58.44	− 0 39 46.35
Amherst	+ 42 22 15.6	− 11 27.5	9.999343	− 0 18 4.8	+ 4 50 7.3
Annapolis	+ 38 58 53.5	− 11 15.0	9.999428	− 0 2 15.60	+ 5 5 56.49
Ann Arbor	+ 42 16 48.0	− 11 27.3	9.999346	+ 0 26 43.10	+ 5 34 55.19
Armagh	+ 54 21 12.7	− 10 54.9	9.999043	− 4 41 36.6	+ 0 26 35.5
Athens	+ 37 58 20.0	− 11 9.4	9.999453	− 6 43 7.8	− 1 34 55.7
Berlin	+ 52 30 16.7	− 11 7.7	9.999088	− 6 1 47.00	− 0 53 34.91
Berne	+ 46 57 8.7	− 11 29.2	9.999227	− 5 37 58.1	− 0 29 46.0
Bethlehem	+ 40 36 23.9	− 11 22.2	9.999388	− 0 6 40.19	+ 5 1 31.90
Birr Castle	+ 53 5 47.0	− 11 3.9	9.999074	− 4 36 31.2	+ 0 31 40.9
Bologna	+ 44 29 47.0	− 11 30.5	9.999289	− 5 53 36.7	− 0 45 24.6
Bonn	+ 50 43 45.0	− 11 17.3	9.999132	− 5 36 35.38	− 0 28 23.29
Bothkamp	+ 54 12 9.6	− 10 56.0	9.999047	− 5 48 42.9	− 0 40 30.8
Breslau	+ 51 6 56.5	− 11 15.4	9.999122	− 6 16 20.80	− 1 8 8.71
Brussels	+ 50 51 10.5	− 11 16.8	9.999129	− 5 25 40.7	− 0 17 28.6
Cambridge (*Eng.*)	+ 52 12 51.6	− 11 9.4	9.999095	− 5 8 34.84	− 0 0 22.75
Cambridge (*Mass.*)	+ 42 22 48.3	− 11 27.6	9.999343	− 0 23 41.11	+ 4 44 30.98
Cape of Good Hope	− 33 56 3.4	+ 10 39.0	9.999550	− 6 22 7.1	− 1 13 55.0
Chapultepec	+ 19 25 17.5	— 7 12.0	9.999841	+ 1 28 26.15	+ 6 36 38.24
Charkow	+ 50 0 10.2	− 11 20.5	9.999150	− 7 33 6.8	− 2 24 54.7
Chicago	+ 41 50 1.0	− 11 26.2	9.999357	+ 0 42 14.69	+ 5 50 26.78
Christiania	+ 59 54 43.7	− 10 0.2	9.998914	− 5 51 5.94	− 0 42 53.85
Cincinnati (*New Obs.*)	+ 39 8 35.5	− 11 15.8	9.999424	+ 0 29 29.33	+ 5 37 41.42
Cincinnati (*Old Obs.*)	+ 39 6 26.5	− 11 15.6	9.999425	+ 0 29 46.85	+ 5 37 58.94
Clinton	+ 43 3 17.0	− 11 28.9	9.999326	− 0 6 34.65	+ 5 1 37.44
Coimbra	+ 40 12 25.8	− 11 20.6	9.999398	− 4 34 37.6	+ 0 33 34.5
Copenhagen	+ 55 41 13.6	− 10 43.9	9.999011	− 5 58 31.3	− 0 50 19.2
Cordoba	− 31 25 15.4	+ 10 13.5	9.999608	− 0 51 27.0	+ 4 16 45.1
Cracow	+ 50 3 50.0	− 11 20.3	9.999149	− 6 28 2.6	− 1 19 50.5
Dantzig	+ 54 21 18.0	− 10 54.9	9.999043	− 6 22 51.4	− 1 14 39.3
Dorpat	+ 58 22 47.4	− 10 17.6	9.998948	− 6 55 5.6	− 1 46 53.5
Dublin	+ 53 23 13	− 11 1.9	9.999066	− 4 42 50	+ 0 25 22
Dun Echt	+ 57 9 36	− 10 30.2	9.998977	− 4 58 32.1	+ 0 9 40.0
Durham	+ 54 46 6.2	− 10 51.6	9.999033	− 5 1 52.3	+ 0 6 19.8
Düsseldorf	+ 51 12 25	− 11 15.0	9.999120	− 5 35 17	− 0 27 5
Edinburgh	+ 55 57 23.2	− 10 41.5	9.999005	− 4 55 29.04	+ 0 12 43.05
Florence	+ 43 46 4.1	− 11 29.9	9.999308	− 5 53 13.6	− 0 45 1.5
Geneva	+ 46 11 58.8	− 11 30.1	9.999246	− 5 32 48.86	− 0 24 36.77
Georgetown	+ 38 54 26.2	− 11 14.6	9.999430	+ 0 0 6.20	+ 5 8 18.29
Glasgow (*Missouri*)	+ 39 16 16.8	− 11 16.4	9.999421	+ 1 3 6.8	+ 6 11 18.9
Glasgow (*Scotland*)	+ 55 52 42.8	− 10 42.2	9.999006	− 4 51 1.5	+ 0 17 10.6

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Gotha	+ 50 56 37.5	− 11 16.3	9.999127	− 5 51 2.62	− 0 42 50.53
Göttingen.	+ 51 31 47.9	− 11 13.3	9.999112	− 5 47 58.33	− 0 39 46.24
Greenwich	+ 51 28 38.4	− 11 13.6	9.999113	− 5 8 12.09	0 0 0
Hamburg.	+ 53 33 7.0	− 11 0.8	9.999062	− 5 48 5.8	− 0 39 53.7
Hanover	+ 43 42 15	− 11 29.8	9.999309	− 0 19 4.13	+ 4 49 7.96
Hastings-on-Hudson .	+ 40 59 25	− 11 23.6	9.999378	− 0 12 42.4	+ 4 55 29.7
Haverford	+ 40 0 36.5	− 11 19.8	9.999402	− 0 6 59.34	+ 5 1 12.75
Helsingfors	+ 60 9 43.3	− 9 57.1	9.998909	− 6 48 1.25	− 1 39 49.16
Hudson	+ 41 14 42.6	− 11 24.4	9.999371	+ 0 17 32.06	+ 5 25 44.15
Kasan	+ 55 47 24.2	− 10 43.0	9.999009	− 8 24 41.0	− 3 16 28.9
Kew	+ 51 28 6	− 11 13.6	9.999114	− 5 6 57.0	+ 0 1 15.1
Kiel	+ 54 20 29.7	− 10 55.0	9.999043	− 5 48 47.85	− 0 40 35.76
Kiew	+ 50 27 11.1	− 11 18.6	9.999139	− 7 10 12.73	− 2 2 0.64
Königsberg	+ 54 42 50.6	− 10 52.0	9.999034	− 6 30 11.00	− 1 21 58.91
Kremsmünster . . .	+ 48 3 23.7	− 11 27.0	9.999199	− 6 4 44.3	− 0 56 32.2
Leiden	+ 52 9 20.0	− 11 9.8	9.999097	− 5 26 8.44	− 0 17 56.35
Leipzig	+ 51 20 6.3	− 11 14.3	9.999117	− 5 57 46.11	− 0 49 34.02
Leyton	+ 51 34 34	− 11 13.0	9.999111	− 5 8 11.22	+ 0 0 0.87
Lisbon (*Marine Obs.*) .	+ 38 42 17.6	− 11 13.5	9.999435	− 4 31 47.1	+ 0 36 25.0
Lisbon (*Royal Obs.*) .	+ 38 42 31.3	− 11 13.6	9.999435	− 4 31 27.41	+ 0 36 44.68
Liverpool.	+ 53 24 4	− 11 1.8	9.999066	− 4 55 54.9	+ 0 12 17.2
Lübec	+ 53 51 31.2	− 10 58.6	9.999055	− 5 50 57.64	− 0 42 45.55
Lund	+ 55 41 52.1	− 10 43.8	9.999011	− 6 0 57.11	− 0 52 45.02
Madison	+ 43 4 33	− 11 28.9	9.999325	+ 0 49 24.1	+ 5 57 36.2
Madras	+ 13 4 8.1	− 5 3.3	9.999926	−10 29 11.5	− 5 20 59.4
Madrid	+ 40 24 30.0	− 11 21.4	9.999393	− 4 53 26.7	+ 0 14 45.4
Manheim	+ 49 29 11.0	− 11 22.5	9.999163	− 5 42 2.61	− 0 33 50.52
Marburg	+ 50 48 46.9	− 11 16.9	9.999130	− 5 43 17.1	− 0 35 5.0
Markree	+ 54 10 31.8	− 10 56.2	9.999047	− 4 34 23.7	+ 0 33 48.4
Marseilles	+ 43 18 19.1	− 11 29.3	9.999320	− 5 29 46.73	− 0 21 34.64
Melbourne	− 37 49 53.3	+ 11 8.6	9.999456	−14 48 6.9	− 9 39 54.8
Mexico	+ 19 26 1.3	− 7 12.2	9.999840	+ 1 28 14.58	+ 6 36 26.67
Milan	+ 45 27 59.2	− 11 30.6	9.999265	− 5 44 58.06	− 0 36 45.97
Modena	+ 44 38 52.8	− 11 30.6	9.999285	− 5 51 54.9	− 0 43 42.8
Montsouris	+ 48 49 18.0	− 11 24.8	9.999180	− 5 17 32.77	− 0 9 20.68
Moscow	+ 55 45 19.8	− 10 43.3	9.999009	− 7 38 29.0	− 2 30 16.9
Munich	+ 48 8 45.5	− 11 26.7	9.999197	− 5 54 38.22	− 0 46 26.13
Naples	+ 40 51 45.4	− 11 23.1	9.999381	− 6 5 13.0	− 0 57 0.9
Neuchatel	+ 46 59 51.0	− 11 29.1	9.999226	− 5 36 2.3	− 0 27 50.2
New Haven	+ 41 18 36.5	− 11 24.6	9.999370	− 0 16 29.90	+ 4 51 42.19
New York (*Columb. Coll.*)	+ 40 45 23.1	− 11 22.7	9.999384	− 0 12 18.40	+ 4 55 53.69
New York (RUTHERFURD)	+ 40 43 48.5	− 11 22.6	9.999384	− 0 12 15.47	+ 4 55 56.62
Nicolaeff	+ 46 58 20.6	− 11 29.2	9.999226	− 7 16 6.2	− 2 7 54.1
Odessa	+ 46 28 36	− 11 29.8	9.999239	− 7 11 14.4	− 2 3 2.3
Ogden.	+ 41 13 8.6	− 11 24.3	9.999372	+ 2 19 47.52	+ 7 27 59.61
Ó-Gyalla	+ 47 52 43.4	− 11 27.4	9.999204	− 6 20 57.68	− 1 12 45.59
Olmütz	+ 49 35 43	− 11 22.1	9.999160	− 6 17 14.7	− 1 9 2.6

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Oxford (*Radcliffe*)	+ 51 45 36.0	− 11 12.0	9.999106	− 5 3 9.5	+ 0 5 2.6
Oxford (*University*)	+ 51 45 34.2	− 11 12.0	9.999106	− 5 3 11.69	+ 0 5 0.40
Padua	+ 45 24 2.5	− 11 30.6	9.999266	− 5 55 41.22	− 0 47 29.13
Palermo	+ 38 6 44	− 11 10.2	9.999440	− 6 1 37.1	− 0 53 25.0
Paramatta	− 33 48 49.8	+ 10 37.8	9.999553	− 15 12 18.3	− 10 4 6.2
Paris	+ 48 50 11.8	− 11 24.8	9.999179	− 5 17 33.11	− 0 9 21.02
Philadelphia	+ 39 57 7.5	− 11 19.5	9.999404	− 0 7 33.64	+ 5 0 38.45
Pola	+ 44 51 49.0	− 11 30.6	9.999280	− 6 3 35.27	− 0 55 23.18
Potsdam	+ 52 22 56	− 11 8.4	9.999091	− 6 0 29	− 0 52 17
Poughkeepsie	+ 41 41 18	− 11 25.8	9.999360	− 0 12 38.5	+ 4 55 33.6
Prague	+ 50 5 18.8	− 11 20.2	9.999148	− 6 5 53.5	− 0 57 41.4
Princeton	+ 40 20 58	− 11 21.2	9.999394	− 0 9 34.6	+ 4 58 37.5
Pulkowa	+ 59 46 18.7	− 10 1.8	9.998917	− 7 9 30.76	− 2 1 18.67
Quebec	+ 46 48 17.3	− 11 29.4	9.999231	− 0 23 22.8	+ 4 44 49.3
Rio de Janeiro	− 22 54 23.8	+ 8 13.9	9.999782	− 2 15 30.68	+ 2 52 41.41
Rome	+ 41 53 53.7	− 11 26.3	9.999355	− 5 58 6.79	− 0 49 54.70
San Fernando	+ 36 27 41.5	− 10 59.5	9.999490	− 4 43 22.5	+ 0 24 49.6
Santiago de Chile	− 33 26 42.0	+ 10 34.4	9.999561	− 0 25 29.7	+ 4 42 42.4
Schwerin	+ 53 37 38.2	− 11 0.2	9.999061	− 5 53 52.8	− 0 45 40.7
Senftenberg	+ 50 5 10.1	− 11 20.2	9.999148	− 6 14 2.7	− 1 5 50.6
Speier	+ 49 18 55.4	− 11 23.2	9.999167	− 5 41 57.7	− 0 33 45.6
Stockholm	+ 59 20 33.0	− 10 6.9	9.998927	− 6 20 26.09	− 1 12 14.00
Stonyhurst	+ 53 50 40	− 10 58.7	9.999055	− 4 58 19.41	+ 0 9 52.68
St. Petersburg	+ 59 56 29.7	− 9 59.8	9.998913	− 7 9 25.6	− 2 1 13.5
Strassburg (*New Obs.*)	+ 48 34 59.7	− 11 25.5	9.999186	− 5 39 16.74	− 0 31 4.65
Strassburg (*Old Obs.*)	+ 48 34 53.8	− 11 25.5	9.999186	− 5 39 14.58	− 0 31 2.49
Sydney	− 33 51 41.1	+ 10 38.3	9.999552	− 15 13 2.7	− 10 4 50.6
Toulouse	+ 43 36 47	− 11 29.7	9.999312	− 5 14 3.2	− 0 5 51.1
Turin	+ 45 4 6.0	− 11 30.7	9.999275	− 5 39 0.5	− 0 30 48.4
Twickenham	+ 51 27 4.2	− 11 13.7	9.999114	− 5 6 59.0	+ 0 1 13.1
Upsala	+ 59 51 31.5	− 10 0.8	9.998915	− 6 18 42.7	− 1 10 30.6
Utrecht	+ 52 5 10.5	− 11 10.2	9.999098	− 5 28 43.8	− 0 20 31.7
Venice	+ 45 25 49.5	− 11 30.6	9.999266	− 5 57 37.5	− 0 49 25.4
Vienna (*Josephstadt*)	+ 48 12 53.8	− 11 26.6	9.999195	− 6 13 37.4	− 1 5 25.3
Vienna (*Old Obs.*)	+ 48 12 35.5	− 11 26.6	9.999195	− 6 13 43.83	− 1 5 31.74
Warsaw	+ 52 13 5.7	− 11 9.4	9.999095	− 6 32 19.5	− 1 24 7.4
Washington	+ 38 53 38.8	− 11 14.5	9.999430	0 0 0	+ 5 8 12.09
West Point	+ 41 23 31	− 11 24.9	9.999368	− 0 12 22.71	+ 4 55 49.38
Wilhelmshaven	+ 53 31 52.0	− 11 0.9	9.999063	− 5 40 47.30	− 0 32 35.21
Williamstown (*Mass.*)	+ 42 42 49	− 11 28.3	9.999334	− 0 15 18.6	+ 4 52 53.5
Williamstown (*Victoria*)	− 37 52 7.2	+ 11 8.8	9.999455	− 14 47 50.9	− 9 39 38.8
Wilna	+ 54 41 0	− 10 52.3	9.999035	− 6 49 24.0	− 1 41 11.9
Windsor	− 33 36 28.9	+ 10 35.9	9.999558	− 15 11 33.8	− 10 3 21.7
Zürich	+ 47 22 40.0	− 11 28.5	9.999216	− 5 42 24.7	− 0 34 12.6

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

The greater portion of this Ephemeris, embracing the positions of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain fixed stars; the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the sun, the moon's longitude and latitude, data for the libration of the moon, the obliquity of the ecliptic, the equation of equinoxes, etc.

TIME.

Astronomers make use of several different kinds of time: mean solar time; apparent solar time; and sidereal time.

Solar Time.—Solar time is that used for all the purposes of ordinary life, and is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour-angle of the sun is called *Solar Time.* This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the same meridian are not exactly equal, owing to the varying motion of the earth round the sun, and to the obliquity of the ecliptic. The intervals between the sun's transits over the meridian being unequal, it is impossible to regulate a clock or chronometer so that it shall accurately follow the sun.

To avoid the irregularity which would arise from using the true sun as the measure of time, a fictitious sun, called a *Mean Sun*, is supposed to move in the equator with a uniform velocity. This mean sun is supposed to keep, on the average, as near the real sun as is consistent with perfect uniformity of motion; it is sometimes in advance of it, and sometimes behind it, the greatest deviation being about 16 minutes of time.

Mean Solar Time, which is perfectly equable in its increase, is measured by the motion of this mean sun. The clocks in ordinary use and the chronometers used by navigators are regulated to mean solar time.

True, or *Apparent Solar Time* is measured by the motion of the real sun.

The difference between apparent and mean time is called the *Equation of Time.* By means of it we change apparent to mean time, or the reverse. Thus, if the apparent time be given, the mean time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I of the Calendar for each month. If the mean time be given, the apparent time is obtained by applying the equation of time as directed by the precept on page II of the Calendar.

Sidereal Time.—Sidereal time is measured by the daily motion of the stars; or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. This point is the vernal equinox, and its hour-angle is called *Sidereal Time.* Astronomical clocks, regulated to sidereal time, are called sidereal clocks.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. It is about $3^m 56^s$ shorter than the mean solar day; 356¼ solar days, or a year, being divided into 366¼ sidereal days. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21st of each year the sidereal clock agrees with the mean time, or ordinary clock; and it gains on it about $3^m 56^s$ per day, so that at the end of a year it will have gained an entire day, and will again agree with it.

Day.—The *Civil Day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each; the first of which is marked A. M., the last is marked P. M.

The *Astronomical Day* commences at noon on the civil day of the same date. It also comprises twenty-four hours; but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical as well as the civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first period of the civil day answers to the last part of the preceding astronomical day, and the last period of the civil day corresponds to the first part of the same astronomical day. Thus, January 9th, 2 o'clock, A. M., civil time, is January 8th, 14^h, astronomical time; and January 9th, 2 o'clock, P. M., civil time, is also January 9th, 2^h, astronomical time. The rule, then, for the transformation of civil time into astronomical time is this:—If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.

To change astronomical to civil time, we simply write P. M. after it, if it is less than 12 hours. If greater than 12 hours, we subtract 12 hours from it, add one to the days, and write A. M. For example, January 3d, 23 hours, astronomical time, is January 4th, 11 o'clock, A. M., civil time.

If the longitude from Greenwich be expressed in time, and, when *west*, *added* to the local time, or, when *east*, *subtracted* from the local time, the result is the corresponding Greenwich time. If the local mean time is used, the result is the Greenwich mean time, which ordinarily is that required for the use of this Ephemeris. The rule is the same, whether we use mean or sidereal time.

THE CALENDAR.

The Calendar is divided into twelve months; and to each month are assigned eighteen pages, the contents of which are as follows:

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when greater accuracy is required, should be first interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is $0^h 0^m 0^s$. The longitude from Greenwich expressed in time, if west, is at that instant the Greenwich apparent time, or time after Greenwich apparent noon; if east, it is time before

Greenwich apparent noon. The longitude of any place is therefore employed in reducing the quantities on this page to apparent noon at that place.

The right ascension of the sun thus reduced is the sidereal time of local apparent noon. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on sidereal time.

The declination of the sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the sun.

As an example of the use of page I: —

Let the sun's declination be required at apparent noon, 1883, May 30th, at a place whose longitude is 180° 20′, or 12ʰ 1ᵐ 20ˢ West from Greenwich.

		h	m	s
Local apparent time . . .	May 30,	0	0	0
Longitude from Greenwich (additive) . . .		12	1	20
Greenwich apparent time . . .	May 30,	12	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is 12ʰ.022 after Greenwich apparent noon on May 30th, or 11ʰ.978 before Greenwich apparent noon on May 31st.

On page 74 of the Ephemeris we find that the change of declination in one hour is

	″
May 30, at Greenwich apparent noon . . .	22.38
May 31, at Greenwich apparent noon . . .	21.44
Difference for one day	0.94

If we want to be very exact, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 30th, this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follows: —

	″
Difference for one hour, May 30	22.38
Change for one day (or 0″.94) × 0.25 . . .	0.24
Difference at 6 hours after noon	22.14

22″.14 × 12.022 = 266″.2 = 4′ 26″.2

	°	′	″
Declination at Greenwich noon, May 30 . . .	N. 21	45	47.7
Change in 12.022 hours (additive) . . .		4	26.2
Sun's declination at time of observation . . .	N. 21	50	13.9

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is 11ʰ.978 before Greenwich noon of May 31st; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is 21″.68. Then, we find: —

	°	′	″
Declination at Greenwich noon, May 31 . .	N. 21	54	33.7
Product of 21″.68 × 11.978 = 259″.7 (subtractive) .		4	19.7
Sun's declination at time of observation . . .	N. 21	50	14.0

It will always be well to make the calculation by both methods, as their agreement will show both to be right. In the above example, the results differ by only 0″.1, a quantity too small to be considered an error.

At sea it is ordinarily sufficient to have the declination to the nearest half minute; and the reduction may be found by Table V of Bowditch's *American Practical Navigator*.

The equation of time, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the apparent time, or the time given by an observation of the sun, to obtain the mean time. The heading of the column directs the manner in which the equation is to be applied. When there is a change in the course of the month from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change takes place. The equation of time, as given on page I, is the mean time of apparent noon, or the hour-angle of the mean sun at that instant.

The Sun's Semidiameter, and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The sun's semidiameter is used in reducing the altitude of the upper or lower limb of the sun to the altitude of the centre; and in reducing the angular distance of the limb from the moon or some other object, to the distance from the centre of the sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon.* The hourly changes of these quantities are also given, and may be used in reducing them to any Greenwich mean time. The hourly changes may be first interpolated for half the Greenwich time, when great precision is required, in the way described in explaining the calculation of the declination.

The right ascension and declination on pages I and II are affected by aberration, and therefore denote the apparent position of the true sun. Page II is more conveniently used when the mean time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to mean time. The quantities on this page can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the mean time from observations of the sun, and the latitude from observations out of the meridian. The heading of the column directs the manner in which it is to be applied to mean time to obtain the apparent time.

The equation of time, as given on page II, is the apparent time of mean noon; and is equivalent to the hour-angle of the true sun at the instant of mean noon.

The sidereal time of mean noon is also the right ascension of the mean sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^s.8565$; or by Table III, appended to this volume, for reducing intervals of mean solar to sidereal time. Table LI of Bowditch's *Navigator* may be used for the same purpose when only the nearest quarter of a second is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the R. A. of the mean sun for this time, as last explained: this being added to the local mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a sidereal interval to a mean time interval, in Table II, appended to this volume, or Table LII of Bowditch's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^s.8296$ by the hours and parts of an hour of the given sidereal time.

As examples of the use of page II: —

1.—Let the sun's right ascension and the equation of time be required for 1883, May 15th, $9^h\ 2^m\ 30^s$, A. M., mean time, at a place whose longitude is 100° 10′, W., or $6^h\ 40^m\ 40^s$.

		h m s
Local astronomical mean time . . .	May 14,	21 2 30
Longitude from Greenwich (additive) . . .		6 40 40
Greenwich mean time	May 15,	3 43 10 = $3^h.7194$

Sun's Right Ascension.	h	m	s	*Equation of Time.*	m	s
May 15, Greenwich noon .	3	27	38.32	May 15, noon . .	3	50.88 (additive).
H. D. $9^s.871$ × 3.7194 . .	+	0	36.71	H. D. — $0^s.014$ × 3.72 .	—	0.05
	3	28	15.03		3	50.83

In this case, the hourly differences interpolated to half the interval, or $1^h.9$ after noon, have been used. The equation of time in this example is additive to mean time. Its reduction could also have been found by Table VI, A., of BOWDITCH's *Navigator*, but to seconds only.

2.—If the sidereal time is required for the same date and time, we have:—

	h	m	s
May 15, Sidereal Time (at Greenwich mean noon). . . .	3	31	29.20
Hourly Difference $9^s.8565$ × 3.7194	+	0	36.66
Add the local astronomical mean time	21	2	30.00
The required sidereal time is (rejecting 24^h)	0	34	35.86

The reduction $0^m\ 36^s.66$ could have been found in Table III corresponding to the Greenwich mean time $3^h\ 43^m\ 10^s$. Also, by Table LI of BOWDITCH's *Navigator*, the reduction is $0^m\ 36^s.7$.

3.—On 1883, May 15, A. M., at a place whose longitude is 100° 10′ W., suppose the sidereal time to be $0^h\ 35^m\ 33^s.37$, and that the corresponding mean time is required.

The astronomical day is May 14; the longitude in time, + $6^h\ 40^m\ 40^s$, or + $6^h.678$.

	h	m	s	
May 14, Sidereal Time (at Greenwich mean noon)	3	27	32.64	
The H. D. $9^s.8565$ × 6.678, or the reduction for $6^h\ 40^m\ 40^s$ in Table III .	+	1	5.82	
The sidereal time of local mean noon	3	28	38.46	
The given sidereal time (+ 24^h, if necessary for the following subtraction)	24	35	33.37	
Subtracting the first from the second gives the sidereal interval from noon .	21	6	54.91	= $21^h.1153$
— $9^s.8296$ × 21.1153, or the reduction for $21^h\ 6^m\ 55^s$ in Table II . .	—	3	27.56	
The required astronomical mean time is . . May 14,	21	3	27.35	

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude*, and *Latitude*, and the *Logarithm of the Radius Vector of the Earth.* The longitudes of the sun are the true longitudes, not corrected for aberration. The longitude is given in two columns, headed λ and λ'; λ representing the sun's longitude counted from the true equinox of the date; and λ', the same co-ordinate counted from the mean equinox of the beginning of the year, (January $0^d.0$). A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The latitude is referred to the ecliptic of the date.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes and seconds after Greenwich mean noon when the first point of Aries passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, $-9^s.8296$. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time; or, approximately, from Table LII of BOWDITCH's *Navigator*.

This column may be used in converting sidereal time to mean time instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 13, that is the preceding astronomical day.

	h	m	s	
May 14, the mean time of Greenwich sidereal noon is . .	20	29	5.45	
The H. D. — $9^s.8296$ × 6.678, or the reduction for long., Table II	—	1	5.64	
The mean time of local sidereal noon	20	27	59.81	
Add the given sidereal time	0	35	33.37	= $0^h.593$
The sum is	21	3	33.18	
— $9^s.8296$ × 0.593, or the reduction for $0^h\ 35^m\ 33^s$ in Table II .	—	0	5.83	
The required astronomical mean time . . May 14,	21	3	27.35	

Page IV contains *The Moon's Semidiameter* and Equatorial *Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272. It may also be obtained from Table XI of BOWDITCH's *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1883, May 1, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of May 1 is 6″.4; then,

$$\text{as } 12^h : 10^h = 6''.4 : 5''.3,$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The moon's semidiameter then, for May 1, 10^h, is 16′ 3″.8 + 5″.3, or 16′ 9″.1.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich*, which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude turned into time, the local time of the moon's meridian passage at any other place may be computed. The reduction may be taken from BOWDITCH's Table XXVIII by simple inspection. The last column of this page contains the *Age* of the moon, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension*, and *Declination*, for each day and hour of Greenwich mean time. They are accompanied with columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer, or obtained by applying the longitude, turned into time, to the local mean time of the observer. The right ascension, or declination, is taken out for the day and hour of the Greenwich mean time; the *Diff. for* 1 *Minute* multiplied by the minutes and parts of a minute of the Greenwich time; and the product added to, or subtracted from, the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1883, May 1, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:—

	Right Ascension. h m s		*Declination.* ° ′ ″
May 1, 10^h	. 22 9 3.13		S. 6 7 6.2
Diff. $2^s.2387 \times 10.500$ . .	= + 23.51	11″.387 × 10.500	= 1 59.6
May 1, $10^h\ 10^m\ 30^s$ . . .	22 9 26.64		S. 6 5 6.6

The differences interpolated for $5^m.2 = 0^h.09$ are for the right ascension. $2^s.2388$, and for the declination 11″.391, which may be used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east, side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true, or geocentric, distance; that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1″; or, as it is usually called, the *Proportional Logarithm of the Difference.* It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearest of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator, subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time,* given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1883, Feb. 9, about 6^{h} of Greenwich mean time, the corrected distance of the moon's centre from that of the sun is *27° 27′ 27″*: —

Corrected distance	$27^{\circ}\ 27'\ 27''$		
Distance in the Ephemeris, Feb. 9, $\mathrm{VI^h}$ . .	27 53 21	P. L.	0.2460
Difference	0 25 54	P. L.	0.8420
	h m s	P. L.	0.5960
Time from $\mathrm{VI^h}$ (after)	+0 45 38		
Corr. for 2d Diff., Table I	+ 2		
Greenwich mean time, Feb. 9	6 45 40		

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:—

From Ephemeris	P. L.	0.2460
Diff. of distances, $25' 54'' = 1554''$	log	3.1914
Red. of Greenwich time, $+0^h 45^m 38^s = 2738^s$ . . .	log	3.4374

The result is the same as by the previous method.

Pages 218—249 contain the geocentric ephemerides of the seven major planets. The positions are referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily difference by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product is subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—263 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The two last columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon -indicated on the left hand side of the page, and the other for the noon which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean noon of the day immediately following; in the case of Venus, Mars, Jupiter, and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 264—271 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan.* 0 give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January 0.

Pages 272—275 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Pages 276 and 277 contain the position of the moon's equator and the mean longitude of the moon, and a table for computing the libration of the moon. The epochs of greatest libration of the moon, together with the formulæ for finding the libration in longitude and latitude are given on page 406.

Page 278 contains, for each tenth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox, and also the aberration and parallax of the sun. The column *Apparent Obliquity of the Ecliptic* (HANSEN) gives the true inclination of the earth's equator to the ecliptic, without correction for the terms depending on the moon's longitude. The *Equation of Equinoxes* is really the astronomical nutation; that given *In Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, as in the year 1883, the true longitudes are greater than those referred to the mean equinox. The equation *In R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic.

The next column gives the *Precession of Equinoxes in Longitude* from January 0 to each of the following dates. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The sun's equatorial horizontal parallax, given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 280 contains the formulæ for the reductions of the positions of the fixed stars, using the notation of Bessel, and the constants of Peters and Struve. The formulæ by which the star-numbers are computed are also given.

Pages 281—284 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D*; that is, *A* must be interchanged with *C*, and *B* with *D*. In the first column along with the solar day is given, for certain dates, the sidereal hour and tenth of midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers: —

Computation of the apparent place of a Lyræ for 1883, *November* 10, *for the upper transit at Washington.*

(Star Catalogue)	log a	0.304	log b	7.884	log c	8.088	log d	8.927*n*
(Page 284)	log A	0.006	log B	0.897	log C	1.098	log D	1.182
(Star Catalogue)	log a'	0.460	log b'	9.995	log c'	9.981	log d'	8.955
	log Aa	0.310	log Bb	8.781	log Cc	9.186	log Dd	0.109*n*
	log Aa'	0.466	log Bb'	0.892	log Cc'	1.079	log Dd'	0.137

Mean Place, 1883.0,	$\alpha_0 =$	18^h 32^m 58^s.647	$\delta_0 =$	+ 38° 40′ 31″.25
	$Aa =$	+ 2.042	$Aa' =$	+ 2.92
	$Bb =$	+ 0.060	$Bb' =$	+ 7.80
	$Cc =$	+ 0.154	$Cc' =$	+ 12.00
	$Dd =$	− 1.287	$Dd' =$	+ 1.37
	$E =$	+ 0.001	$\tau\mu' =$	+ 0.23
	$\tau\mu =$	+ 0.016		
Apparent Place, 1883, *Nov.* 10,	$\alpha =$	18 32 59.633	$\delta =$	+ 38 40 55.57

Pages 285—292 contain the *Independent Star-Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of Bessel by the relations given on page 280, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, a, b, c, d, a', b', c', d'. The independent star-numbers are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star-numbers: —

Computation of the apparent place of α Lyræ for 1883, *November* 10, *for the upper transit at Washington.*

$\alpha_0 =$	$18^{h}\ 33^{m}.0$			$\delta_0 =$	$+38^{\circ}\ 40'.5$
$G =$	1 24.9			$G+\alpha =$	$19^{h}\ 57^{m}.9$
$H =$	2 37.8			$H+\alpha =$	21 10.8
$\log \frac{1}{15}$	8.824	$\log \frac{1}{15}$	8.824		h m s
$\log g$	1.338	$\log h$	1.295	$\alpha_0 =$	18 32 58.647
$\log \sin (G+\alpha)$	9.940 *n*	$\log \sin (H+\alpha)$	9.828 *n*	$f =$	+ 3.115
$\log \tan \delta$	9.903	$\log \sec \delta$	0.108	$(g) =$	− 1.012
$\log (g)$	0.005 *n*	$\log (h)$	0.055 *n*	$(h) =$	− 1.135
				$\tau \mu =$	+ 0.016
		Apparent Right Ascension			= 18 32 59.631
$\log g$	1.338	$\log h$	1.295		° ′ ″
$\log \cos (G+\alpha)$	9.692	$\log \cos (H+\alpha)$	9.869	$\delta_0 =$	+ 38 40 31.25
$\log (g')$	1.030	$\log \sin \delta$	9.796	(g')	+ 10.72
		$\log (h')$	0.960	(h')	+ 9.12
$\log i$	0.735			(i)	+ 4.25
$\log \cos \delta$	9.893			$\tau \mu'$	+ 0.23
$\log (i)$	0.628				
		Apparent Declination			= + 38 40 55.57

Pages 293—301 contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1883, or the moment when the sun's mean longitude is 280°.

The annual variations are to be considered as the differential co-efficients of each co-ordinate with respect to the time at the beginning of the year.

In order that the list of mean places of stars may serve the purpose of a working-catalogue for the convenient use of astronomers, the position of each of the northern circumpolar stars is given in duplicate; one position being for the upper and the other for the lower culmination. The positions for the lower culmination are marked S. P. In this case, the right ascensions are the sidereal times at which the star crosses the lower meridian; and, in order to have the expressions for the co-ordinates congruous in all cases, the declinations are counted from the equator through the north pole, and therefore exceed 90°. The method of obtaining the time of observation and setting of the circle in order to find a star on the meridian is then uniform for all the stars.

Beginning with the volume for 1882, the number of stars has been greatly increased, in order to make the list more useful to field-astronomers. The apparent places are not, however, given for the stars then added for the first time. In order to show at a glance these additional stars, they are indicated in the list by an asterisk.*

Pages 302—313 contain the apparent positions of the four north polar stars, α, δ, and λ Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. They include the terms depending on the moon's longitude. The mean solar time of transit is given in the column *Mean Solar Day*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 302, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But, the lower transit following that of July 1st does not take place until July 2.3. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of mean solar date.

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* It is contemplated to issue a supplement to the Ephemeris for 1883, containing apparent right ascensions of these additional stars for the years 1881—1883.

Pages 314—364 contain, for every tenth upper transit at Washington, the apparent places of those stars of the preceding list which are not marked with an asterisk. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit may be readily identified. Along with each co-ordinate is given, in small type, the change for ten days. This quantity is to be regarded as the differential co-efficient corresponding to the dates for which the star places are given.

Pages 365—372 contain the apparent right ascension, declination, and semidiamter of the sun, and the sidereal time, all for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The equation of time for apparent noon is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the Ephemeris for the meridian of Greenwich.

Pages 373—380 contain the right ascension, declination, semidiameter, and parallax of the moon at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated; and the one which is deficient is printed in smaller type. When the illumination is so nearly equal that no choice can be made between them, both are printed in large type.

Pages 381—397 contain the geocentric apparent right ascensions and declinations of the seven major planets, and their semidiamters and horizontal parallaxes, for the moments of all those transits over the meridian of Washington which can be observed.

PHENOMENA.

This portion of *The American Ephemeris and Nautical Almanac* gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 400—405 inclusive contain the elements necessary for computing the two eclipses of the sun which occur during the year.

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour during the eclipse. The principal circumstances of each eclipse are as follow:—

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central eclipse at noon" indicates the moment when the axis of the shadow is coincident with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point the eclipse will be central at the moment of apparent noon.

"Central eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the time of beginning and ending and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1883, October 30th, begins and ends at Tokio, Japan. We find this city to be situate slightly inside of the line of beginning at sunrise. The eclipse therefore begins a few minutes before sunrise. We also see that Japan is just inside the curve of beginning at nine hours. As the motion of the shadow when it first touches the earth is very rapid, the time of beginning is a very few minutes before nine hours, probably eight hours fifty-five minutes, Greenwich mean time. For the time of ending we find Tokio to be situate between the curves of 11 hours and 12 hours, and nearer to 12 hours than 11. The ratio of the distance from the two curves would correspond to 11 hours 42 minutes. But, when we compare the distance of the curves with the distance between the curves of 12 hours and 13 hours we find it to be diminishing. Allowing 6 minutes for this change, the time of ending would be 11 hours 36 minutes—which is probably within 3 or 4 minutes of the truth. Changing to local time the result will be

		h	m
Greenwich mean time of ending, ...	Oct. 30,	11	36
Longitude, east of Greenwich, ...		9	20
Local mean time of ending, ...	Oct. 30,	20	56 ± 3m

A rough idea of the magnitude of the eclipse may be obtained by the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total; while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements, which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the centre of the earth and perpendicular to the right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane.* We take the intersection of this plane with that of the earth's equator as the axis of X, the axis of Y being perpendicular and directed toward the north. x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVENET's *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular, and negative for a total eclipse.

The angles f and f', the tangents of which are given, are the angles which each element of the respective shadow-cones makes with the axis of the shadow; or, they are the semi-angles of the two cones.

At the bottom of the table are given the logarithms of the change of x, y and μ, in one minute, in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows. It is premised that the moments ot beginning and ending are those at which the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find such distance and radius we compute—

(1) The co-ordinates, ξ, η, and ζ, of the observer, at some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase, together with their variations for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their variations for one minute, are taken from the tables of elements.

(3) Hence, the position and motion of the observer relative to the axis of the shadow.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to its radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the geocentric latitude. These may be obtained from geodetic tables, or may be computed from the following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$
$$\rho \sin \varphi' = G \sin \varphi$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	log F.		log G.	
0°	+ 0.00000		− 0.00302	
		1		2
5	0.00001		0.00300	
		4		3
10	0.00005		0.00297	
		5		5
15	0.00010		0.00292	
		8		8
20	0.00018		0.00284	
		9		9
25	+ 0.00027		− 0.00275	
		11		11
30	0.00038		0.00264	
		12		12
35	0.00050		0.00252	
		12		13
40	0.00062		0.00239	
		13		13
45	0.00075		0.00226	
		13		13
50	+ 0.00088		− 0.00213	
		13		12
55	0.00101		0.00201	
		12		12
60	0.00113		0.00189	
		11		11
65	0.00124		0.00178	
		9		9
70	0.00133		0.00169	
		8		8
75	+ 0.00141		− 0.00161	
		5		6
80	0.00146		0.00155	
		4		3
85	0.00150		0.00152	
		1		1
90	+ 0.00151		− 0.00151	

(1) For the assumed Greenwich mean time of computation take from the table of elements, pages 402 or 404, the values of $\sin d$, $\cos d$, and μ. Put:

λ, the longitude west from Greenwich. The co-ordinates of the observer will then be:—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda)$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda)$$

and their variations in one minute of mean time will be:—

$$\xi' = [7.6398] \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.6398] \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.6398] \xi \sin d$$

ζ' is not wanted.

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute we represent by x' and y'. Their logarithms are given at the foot of the tables.

(3) The distance m and position angle M of the axis of the shadow, and the relative motions, n and N, are computed by the formulæ:—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formulæ

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus. Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth when $\sin \psi$ is negative. The correction τ to the assumed time will be found in minutes, from

$$\tau = \frac{L \cos \psi}{n} - \frac{m \cos (M - N)}{n}$$

There will be two values of τ corresponding to the two values of ψ, the algebraically smaller of which being applied to the assumed time, will give the time of beginning; and the other, the time of ending.

One such pair of values cannot, however, give the time of both beginning and ending with accuracy. To attain accuracy it is necessary to assume two times, one as near as practicable to that of beginning, and another near that of ending. These approximate times may be derived from the chart. We shall thus have two pairs of values of τ. The computation for the first assumed time will give a small and approximate value for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and approximate value for the end, and a large negative and inaccurate one for the beginning. We shall thus deduce two times of beginning and two of ending, of each of which only one is to be considered approximately correct.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

THEOREM.—*The error of each result is approximately proportional to the square of the correction τ, multiplied by the sine of the sun's hour-angle, $(\mu-\lambda)$, for the middle of the interval between the time of computation and that of the phase.*

To apply this theorem we find the two values of $\tau^2 \sin(\mu-\lambda)$, corresponding to each phase the ratio of which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate result in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^{\mathrm{m}}.001\ \tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, farther corrections may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

Position Angle of Point of Contact.—The position angle, P, of the point of contact, reckoned from the north point of the sun's limb toward the east, is found by the formula

$$P = N + \psi,$$

the value of ψ being taken to correspond to the phase. The angle ψ will generally be in the same quadrant with $M - N$.

As an example of the computation, we shall compute the four principal phases of the annular eclipse of 1883, October 30, for Sendai, Japan:—

Latitude, $\varphi = +\ 38^\circ\ 17'$
Longitude, $\lambda = -\ 140\ \ 50.$

The constants for the place are computed thus:—

$\log \sin \varphi$	9.79208	$\log \cos \varphi$	9.89485
$\log G$	−0.00243	$\log F$	+0.00058
$\log \rho \sin \varphi'$	9.78965	$\log \rho \cos \varphi'$	9.89543

From the chart, and the table on page 405 we find approximate times of the phases as follows:—

	h	m	
Beginning,	8	50	Greenwich Mean Time.
Annulus,	10	10	
Ending,	11	45	

	Beginning.	Annulus.	Ending.
	h m	h m	h m
Greenwich Mean Times	8 50	10 10	11 45
μ	136° 33′.5	156° 33′.6	180° 18′.8
$\mu - \lambda$	277 23.5	297 23.6	321 8.8
$\log \sin d$	−9.38048	− 9.38101	− 9.38167
$\log \cos d$	9.98710	9.98707	9.98702
$\log \sin (\mu - \lambda)$	− 9.99638	− 9.94835	− 9.79749
$\log \rho \cos \varphi' \sin d$	− 9.27591	− 9.27644	− 9.27710
$\log \cos (\mu - \lambda)$	9.10941	9.66285	9.89140
$\log \rho \cos \varphi' \cos d$	9.88253	9.88250	9.88245
$\log \xi$	− 9.89181	− 9.84378	− 9.69292

		Beginning.	Annulus.	Ending.
		h m	h m	h m
Greenwich Mean Times		8 50	10 10	11 45
	$\log \rho \cos \varphi' \sin d \cos (\mu - \lambda)$	− 8.38532	− 8.93929	− 9.16850
	$\log \rho \sin \varphi' \cos d$	9.77675	9.77672	9.77667
	$\log \rho \cos \varphi' \cos d \cos (\mu - \lambda)$	8.99194	9.54535	9.77385
	$\log \rho \sin \varphi' \sin d$	− 9.17013	− 9.17066	− 9.17132
	$\log \xi'$	6.6446	7.1981	7.4266
	$\log \eta'$	6.9121	6.8646	6.7144
	ξ	− 0.77948	− 0.69788	− 0.49308
Table, page 404	x	− 1.36173	− 0.70851	+ 0.06738
	$x - \xi$	− 0.58225	− 0.01063	+ 0.56046
	η	+ 0.62235	+ 0.68493	+ 0.74536
	y	+ 0.83892	+ 0.68425	+ 0.50086
	$y - \eta$	− 0.21657	− 0.00073	− 0.24450
	$\log \xi$	− 8.6972	9.3073	9.6491
Table	$\log \tan f$, Penumbra	7.6733	. . . .	7.6733
	$\log \tan f$, Shadow	. . . .	7.6712	. . . .
For Penumbra,	l	0.57258	. . . .	0.57267
	L	0.57281	. . . .	0.57057
For Annulus,	l	. . . .	+ 0.02664	. . . .
	L	. . . .	+ 0.02569	. . . .
	x'	+ 0.008164	+ 0.008166	+ 0.008168
	ξ'	+ 0.000441	+ 0.001578	+ 0.002671
	$x' - \xi'$	+ 0.007723	+ 0.006588	+ 0.005497
	y'	− 0.001935	− 0.001932	− 0.001929
	η'	+ 0.000817	+ 0.000732	+ 0.000518
	$y' - \eta'$	− 0.002752	− 0.002664	− 0.002447
	$\log m \sin M$	− 9.76511	− 8.0265	+ 9.74855
	$\log m \cos M$	+ 9.33560	− 6.8633	− 9.38828
	$\log n \sin N$	+ 7.8878	+ 7.8188	+ 7.7401
	$\log n \cos N$	− 7.4396	− 7.4255	− 7.3886
	M	290° 24′	266° 4′	113° 34′
	N	109 37	112 1	114 0
	$M - N$	180 47	154 3	− 0 26
	$\log L$	9.75801	8.4098	9.75631
	$\log \sin (M - N)$	− 8.136	9.6411	− 7.879
	$\log m$	9.79325	8.0275	9.78638
	$\log \cos (M - N)$	− 9.99996	− 9.9538	9.99999
	$\log n$	7.9137	7.8517	7.7794
	$\log \sin \psi$	− 8.171	9.2588	− 7.909
	$\log \cos \psi$	9.99995	9.9927	9.99999
	$\log \frac{L \cos \psi}{n}$	1.84426	0.5508	1.97690
	$\log \frac{m \cos (M - N)}{n}$	− 1.87951	− 0.1296	2.00697
	$-\frac{m \cos (M - N)}{n}$	+ 75.772	+ 1.348	−101.619
	$\pm \frac{L \cos \psi}{n}$	± 69.865	± 3.555	± 94.820
	τ_1	+ 5.907	− 2.207	− 6.799
	τ_2	+145.6	+ 4.903	−196.4

We note that the values of τ_1 for the times of beginning and ending respectively, being applied to the assumed times, give nearly accurate values of the times of those phases, but that these times may receive a slight correction from the comparison with the times given by applying τ_3, as just explained.

For the time of beginning we have:—

From computation for end, $11^h\ 45^m + \tau_3 = 8^h\ 28^m.6$
From computation for beginning, $8^h\ 50^m + \tau_1 = 8^h\ 55^m.907$
Difference between the two results . . . 27.3
Ratio of $\tau_3 : \tau_1 = 196.4 : 5.91 = 33.2$; its square $= 1102$
$\sin(\mu_1 - \lambda) : \sin(\mu_3 - \lambda) = \sin 300^\circ : \sin 277^\circ = 0.88$
$0.88 \times 1102 = 970 : 1 =$ error of τ_3 : error of τ_1

$$\text{Error of } \tau_1 = \frac{\tau_3 - \tau_1}{969} = 0^m.028$$

Concluded Greenwich mean time of beginning, $8^h\ 55^m.907 + 0^m.028 = 8^h\ 55^m.935$.

For the time of ending we have:—

From computation for beginning, $8^h\ 50^m + \tau_3 = 11^h\ 15^m.6$
From computation for end, $11^h\ 45^m + \tau_1 = 11^h\ 38^m.201$
Difference between the two results . . . 22.6
Ratio of $\tau_3 : \tau_1 = 145.6 : 6.80 = 21.4$; its square $= 458$
$\sin(\mu_3 - \lambda) : \sin(\mu_1 - \lambda) = \sin 300^\circ : \sin 321^\circ = 1.38$
$1.38 \times 458 = 632 : 1 =$ error of τ_3 : error of τ_1

$$\text{Error of } \tau_1 = \frac{\tau_3 - \tau_1}{631} = 0^m.036$$

Concluded Greenwich mean time of end, $11^h\ 38^m.201 + 0^m.036 = 11^h\ 38^m.237$.

A repetition of the computation gives $8^h\ 55^m.944$ for the Greenwich mean time of beginning, and $11^h\ 38^m.251$ for that of ending.

The concluded times of the phases are therefore:—

	h	m	s	
Beginning of eclipse	8	55	56.6	Greenwich Mean Time.
Beginning of annulus	10	7	47.6	
End of annulus	10	14	54.2	
End of eclipse	11	38	15.1	

This time of beginning is about 10 minutes before sunrise at Sendai.

For the position angle we have:—

	°	′	°	′
N	109	37	114	0
ψ	180	51	− 0	28
P	290	28	113	32

Elements of Occultations.—Pages 407—482 give the elements for the prediction of the times of occultation of stars and planets by the moon. In the columns referring to the star, those headed *Red'ns from* 1883.0 give the quantities necessary to reduce the mean place of the star at the beginning of 1883 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

The quantities in the following five columns are all given for the moment of geocentric conjunction of the star and moon in right ascension. Let there be a line passing from the star through the centre of the moon, and let a plane perpendicular to this line pass through the centre of the earth: this plane will be the fundamental plane for the occultation. The system of co-ordinates is similar to that already described for eclipses. The cone circumscribing the moon and star may be regarded as a cylinder having every where the same diameter as the moon. This cylinder will intercept the fundamental plane in a circle of which the linear diameter will be the same as that of the moon.

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At this moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle H* gives the common geocentric hour angle of the moon and star at the same moment, counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the Besselian co-ordinate y at the same moment. Columns x' and y' give the hourly variation of x and y. The linear unit in these columns is the earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star behind the limb of the moon may be computed for any part of the earth by a method nearly the same as that already explained for computing eclipses, only more simple.

We shall first show how to compute an isolated occultation for a particular place, assuming it to be visible at that place, and then show how all the occultations which will be visible at a place may be selected and computed by a more rapid process.

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed with three or four places of decimals by the formulæ,

$$\rho \sin \varphi' = G \sin \varphi$$
$$\rho \cos \varphi' = F \cos \varphi$$

already given in connection with the eclipses.

As in the case of eclipses, it is necessary to have an approximate time of the phenomenon, corresponding to that obtained from the charts of the eclipses. The quantity H being the Washington west hour-angle of the two bodies at the moment of geocentric conjunction, $H - \lambda$ will be the local hour-angle at this same moment. Let us call this angle h_0, putting

$$h_0 = H - \lambda$$

The next step will then be to find the approximate moment of apparent conjunction in right ascension as seen from the place. An approximate correction to reduce the time and hour-angle for geocentric conjunction to those for apparent conjunction may be taken from Mr. DOWNES's table on the two following pages. This correction will have the same sign as h_0.

When this table is not available, the correction may be computed thus: Compute the quantities ξ_0, ξ', and τ from the formulæ

$$\xi_0 = \rho \cos \varphi' \sin h_0$$
$$\xi' = [9.4192] \cos (h_0 + \tfrac{1}{3} h_0)$$
$$\tau = \frac{\xi_0}{x' - \xi'}$$

τ will then be the approximate interval between the times of geocentric and local conjunction. By applying it to the Washington mean time of the former, as given with the elements, we shall have the Washington mean time of the latter within a few minutes.

The average duration of an occultation is about an hour. Thence, by adding and subtracting $0^h.5$ to the mean time of apparent conjunction, we shall have rough times of the phases of immersion and emersion for farther computation. Let us then put,

$\tau_1 = \tau - 0^h.5$
$\tau_2 = \tau + 0^h.5$
T, the Washington mean time of geocentric conjunction in R. A.
d, the declination of the star.

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h		Lat. 72°			Lat. 66°			Lat. 60°			Lat. 54°			Lat. 48°			Lat. 42°			Lat. 36°		
		x'			x'			x'			x'			x'			x'			x'		
		.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10	2	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	6	5	6	7
	20	3	3	4	4	5	5	5	6	7	6	7	9	8	9	11	9	10	12	11	12	14
	30	5	5	6	6	7	8	8	9	11	10	11	13	12	13	16	14	16	18	16	18	22
	40	6	7	8	8	9	11	11	12	14	13	15	17	16	18	21	18	21	24	21	24	29
	50	7	8	10	10	11	13	13	15	17	16	19	21	19	22	26	22	26	30	26	30	36
1	0	9	10	11	12	14	16	16	18	21	19	22	26	23	26	31	26	31	36	30	35	42
	10	10	12	13	14	16	18	18	21	24	22	26	30	26	30	36	31	35	42	35	40	48
	20	12	13	15	16	18	21	21	23	27	25	29	34	30	34	40	35	40	47	39	45	54
	30	13	15	17	18	20	23	23	26	30	28	32	37	33	38	45	39	44	52	43	50	59
	40	14	16	18	20	22	25	25	29	33	31	35	41	36	42	49	42	48	57	47	54	64
	50	16	18	20	21	24	28	27	31	36	34	38	44	39	45	53	45	52	61	51	58	68
2	0	17	19	22	23	26	30	29	33	39	36	41	47	42	48	56	48	55	65	54	62	72
	10	18	20	23	25	28	32	31	36	41	38	43	50	45	51	59	51	59	68	57	66	76
	20	19	22	24	26	30	34	33	38	43	40	46	53	47	54	62	54	62	71	60	69	80
	30	20	23	26	28	31	36	35	40	45	42	48	55	50	56	65	57	64	74	63	72	83
	40	21	24	27	29	33	37	37	42	47	44	50	58	52	59	68	59	67	77	65	74	86
	50	22	25	28	30	34	39	38	43	49	46	52	60	54	61	70	61	69	79	68	76	88
3	0	23	26	30	31	35	40	40	45	51	48	54	62	56	63	72	63	71	81	70	79	90
	10	24	27	31	33	36	42	41	46	53	49	56	63	57	65	74	65	73	83	72	81	92
	20	25	28	32	34	38	43	42	47	54	51	57	65	59	66	75	66	74	85	73	82	93
	30	26	29	33	35	39	44	43	49	55	52	58	66	60	67	77	68	76	86	74	83	95
	40	26	29	33	36	40	45	44	50	56	53	59	67	61	69	78	69	77	87	75	84	96
	50	27	30	34	36	41	46	45	51	57	54	60	68	62	70	79	70	78	88	76	85	96
4	0	28	31	35	37	41	47	46	52	58	55	61	69	63	70	79	71	79	89	77	86	97
	10	28	31	35	38	42	47	47	52	59	56	62	70	64	71	80	71	79	89	78	86	97
	20	29	32	36	38	42	48	47	53	59	56	62	70	64	71	80	72	80	89	78	87	97
	30	29	32	36	39	43	48	48	53	60	57	63	71	65	72	81	72	80	90	79	87	97
	40	29	33	37	39	43	49	48	53	60	57	63	71	65	72	81	72	80	89	79	87	97
	50	30	33	37	39	44	49	48	54	60	57	63	71	65	72	81	72	80	89	79	87	96
5	0	30	33	37	39	44	49	49	54	60	57	63	71	65	72	90	72	80	89	78	86	95
	10	30	33	37	40	44	49	49	54	60	57	63	71	65	72	80	72	79	88	78	86	95
	20	30	33	37	40	44	49	49	54	60	57	63	71	65	71	79	72	79	88	78	85	94
	30	30	33	37	40	44	49	49	54	60	57	63	70	64	71	79	71	78	87	77	85	93
	40	30	33	37	39	44	49	48	53	59	56	62	70	64	70	78	70	77	86	76	84	91
	50	30	33	37	39	43	48	48	53	59	56	61	69	63	70	77	70	77	85	75	83	90
6	0	30	33	37	39	43	48	48	52	58	55	61	68	63	69	76	69	76	84	74	82	89
	10	30	33	37	39	43	47	47	52	58	55	60	67	62	68	75	68	75	82	73	80	87
	20	29	32	36	38	42	47	47	51	57	54	60	66	61	67	74	67	73	81	72	79	85
	30	29	32	36	38	42	46	46	51	56	53	59	65	60	66	73	66	72	80	71	78	84
	40	29	32	35	37	41	46	45	50	55	53	58	64	59	65	71	65	71	78	70	76	82
	50	28	31	35	37	40	45	45	49	54	52	57	62	58	63	70	63	69	76	68	74	80
7	0	28	31	34	36	40	44	44	48	53	51	55	61	57	62	68	62	68	75	67	73	78
	10	27	30	34	35	39	43	43	47	52	50	54	60	56	61	67	61	66	73	65	71	76
	20	27	30	33	35	38	42	42	46	51	48	53	58	54	59	65	59	65	71	64	69	74
	30	26	29	32	34	37	41	41	45	49	47	52	57	53	58	63	58	63	69	62	67	71
	40	26	28	31	33	36	40	40	44	48	45	50	55	51	56	62	56	61	67			
	50	25	27	31	32	35	39	39	42	47	45	49	53	50	54	60	54	59	65			
8	0	24	27	30	31	34	38	38	41	45	43	47	52	48	52	58	53	57	63			
	10	24	26	29	30	33	37	36	40	44	42	46	50	47	51	56	52	55	60			
	20	23	25	28	29	32	35	35	38	42	40	44	48	45	49	54						
	30	22	24	27	28	31	34	34	37	41	39	42	46	43	47	52						
	40	21	23	26	27	30	33	33	35	39	37	41	44	41	45	49						
	50	20	22	25	26	28	31	31	34	37	36	39	42	40	43	47						
9	0	19	21	24	25	27	30	30	32	35	34	37	40									
	10	18	20	22	24	26	28	28	31	34	32	35	38									
	20	18	19	21	22	24	27	27	29	32	31	33	36									
	30	16	18	20	21	23	25	25	27	30	29	31	34									
	40	15	17	19	20	22	24	24	26	28	27	29	32									

(*Concluded at bottom of next page.*)

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h	Lat. 30°			Lat. 24°			Lat. 18°			Lat. 12°			Lat. 6°			Lat. 0°		
	x'			x'			x'			x'			x'			x'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	7	8	7	7	9	7	8	9	7	8	10	7	8	10	8	9	11
20	12	14	16	13	14	18	14	16	19	14	16	20	14	17	21	15	18	21
30	17	20	24	19	22	27	20	24	29	21	25	30	21	25	31	22	26	32
40	23	27	32	25	29	36	26	32	39	28	33	40	28	34	41	29	34	42
50	28	33	40	31	36	44	32	39	48	35	40	50	35	42	51	35	42	52
1 0	33	39	47	36	42	52	38	46	56	40	47	59	41	49	60	41	49	61
10	38	45	54	41	48	59	44	52	63	46	54	67	47	56	68	47	56	69
20	43	50	60	46	54	65	49	58	70	52	60	74	53	62	75	53	63	76
30	48	55	66	51	60	71	54	64	76	57	66	79	58	68	81	59	69	82
40	52	60	71	56	65	77	59	69	82	62	72	84	63	73	87	64	74	88
50	56	64	76	60	69	82	64	74	87	66	77	89	68	78	92	68	79	93
2 0	59	68	80	64	73	86	68	78	91	70	81	95	72	83	97	72	83	98
10	62	72	84	67	77	90	71	81	95	74	85	99	75	87	101	76	87	102
20	65	75	87	70	81	94	74	85	99	77	88	103	78	90	105	79	91	106
30	68	78	90	73	84	97	77	88	102	80	91	106	81	93	108	82	94	109
40	71	81	93	76	87	100	80	91	105	83	94	109	84	96	111	85	97	112
50	74	83	96	78	89	102	82	93	107	85	96	111	87	98	113	87	99	114
3 0	76	85	98	80	91	104	84	95	109	87	98	113	89	100	115	89	101	116
10	77	87	99	82	92	106	86	97	111	89	100	114	91	102	116	91	103	117
20	79	89	101	84	94	107	88	99	112	91	102	115	92	104	118	93	104	118
30	80	90	102	85	95	108	89	100	113	92	103	116	94	105	119	94	105	119
40	81	91	103	86	96	109	90	101	114	93	104	117	95	106	119	95	106	120
50	82	92	104	87	97	110	91	101	114	94	104	118	95	106	120	96	107	120
4 0	83	92	104	88	98	110	92	102	114	94	105	118	96	107	120	97	107	120
10	84	93	104	88	98	110	92	102	114	95	105	118	96	107	120	97	107	120
20	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	120
30	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	119
40	84	93	104	89	98	109	92	102	113	95	104	116	96	106	118	97	107	119
50	84	93	103	88	97	108	92	101	113	94	104	115	96	106	117	96	106	118
5 0	84	92	102	88	97	108	91	101	112	94	103	114	95	105	116	96	105	117
10	83	92	102	88	96	107	91	100	110	93	102	113	95	104	115	95	104	115
20	83	91	101	87	95	106	90	99	109	92	101	112	94	103	114	94	103	114
30	82	90	100	86	94	104	89	98	108	92	100	111	93	102	112	93	102	113
40	81	89	98	85	93	103	88	97	106	91	99	109	92	100	110			
50	80	88	97	84	92	101	87	95	105	89	97	107						
6 0	79	87	95	83	91	100	86	94	103	88	96	105						
10	78	85	94	82	89	98	84	92	101									
20	77	84	92	80	88	96	82	91	99									
30	75	82	90	79	86	94												
40	74	81	88	77	84	92												
50	72	79	86															
7 0	71	77	84															

(Concluded from preceding page.)

h	Lat. 72°			Lat. 66°			Lat. 60°			*h*	Lat. 72°			Lat. 66°			Lat. 60°		
	x'			x'			x'				x'			x'			x'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50		.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	h m	m	m	m	m	m	m	m	m	m
9 50	14	16	18	18	20	22	22	24	26	11 0	7	8	8	9	10	11	10	11	12
10 0	13	15	16	17	19	21	20	22	24	10	6	6	7	7	8	9	9	9	10
10	12	14	15	16	17	19	19	21	22	20	5	5	6	6	6	7	7	8	8
20	11	12	14	15	16	17	17	19	20	30	3	4	4	4	5	5			
30	10	11	12	13	14	16	16	17	18	40	2	3	3	3	3	4			
40	9	10	11	12	13	14	14	15	16	50	1	1	1	1	2	2			
50	8	9	10	10	11	12	12	13	14	12 0	0	0	0	0	0	0			

(2) Compute for the moments $T + \tau_1$ and $T + \tau_2$ the following quantities, in which we write τ for each of the quantities τ_1 and τ_2. The latter, when used as angles, are to be changed to arc by multiplying by 15°, and the minutes are to be further increased by one-sixth the number of degrees in order to reduce to the sidereal hour-angle.

$$\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + \tau) \\
\eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (h_0 + \tau) \\
\xi' &= [9.4192]\, \rho \cos \varphi' \cos (h_0 + \tau) \\
\eta' &= [9.4192]\, \rho \cos \varphi' \sin d \sin (h_0 + \tau) = [9.4192]\, \xi \sin d \\
x &= x' \tau \\
y &= Y + y' \tau.
\end{aligned}$$

Compute m, M, n and N from the equations

$$\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \xi' \\
n \cos N &= y' - \eta' \\
n' = \frac{n}{60} &= [8.2218]\, n \\
\sin \psi &= [0.5650]\, m \sin (M - N)
\end{aligned}$$

Then, t_1 and t_2 from the equations

$$t_1 = -\frac{m}{n'} \cos (M - N) \mp \frac{[9.4350]}{n'} \cos \psi$$

$$t_2 = -\frac{m}{n'} \cos (M - N) \pm \frac{[9.4350]}{n'} \cos \psi$$

The quantities t_1 and t_2 will then be the corrections in minutes to be applied to the respective times $T + \tau_1$ and $T + \tau_2$ to obtain the Washington mean times of the phases.

As in the case of eclipses, the small value of t_1 will give an accurate result for one phase, and the large value an inaccurate result for the other. Both accurate results may then be corrected by comparison with the inaccurate one, in the way described for eclipses, and a result obtained which will probably be correct within a fraction of a minute of time.

As a check upon the result, it will be advisable to compute ξ, η, x and y for the moments finally obtained. If the times are correct these quantities will fulfil the condition

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2723$$

If $\log m \sin (M - N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\sin \psi < 1$, or $\sin \psi > 1$. In the latter case, the impossible value of $\sin \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the ephemerides of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 90°$, or $270°$, according as $m \sin (M - N)$ is plus or minus; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M - N)}{n'}$$

Putting π for the moon's horizontal parallax the distance from the moon's limb will be

$$\pi\, [m \sin (M - N) - 0.2723],$$

disregarding the sign of $m \sin (M - N)$; or, allowing for the augmentation of the semi-diameter,

$$\pi\, [m \sin (M - N) - 0.2723]\, [1 + z \sin \pi],$$

where $$z = \rho \cos \varphi' \cos d \cos (h_0 + \tau) + \rho \sin \varphi' \sin d$$

The position angle, P, of the line from the moon's centre to the star at the times of contact, reckoned from the north point toward the east, is given by the formulæ: —

$$P = N + \psi - 180^{\circ} \quad \text{for immersion,}$$
$$P = N + \psi + 180 \quad \text{for emersion.}$$

The angle ψ is to be taken to correspond to its application in each case, namely:

Immersion: Second quadrant when $\sin(M - N)$ is positive.
Third quadrant when $\sin(M - N)$ is negative.
Emersion: First quadrant when $\sin(M - N)$ is positive.
Fourth quadrant when $\sin(M - N)$ is negative.

To find the angle from the vertex we compute the angle C from the formula: —

$$\tan C = \frac{\xi + t\,\xi'}{\eta + t\,\eta'}$$

in which the value of t corresponding to the phase is to be used. Then: —

$$V = P - C$$

is the angle from the vertex, also reckoned from the north toward the east.

As an example of an isolated occultation we shall compute that of α Virginis, on 1883, January 1, as seen at the Observatory, Cordoba, of which the position is—

$$\varphi = -\ 31^{\circ}\ 25'.3$$
$$\lambda = -\ \ 0^{h}\ 51^{m}.4$$

From (1) of eclipses we find,

$$\log \rho \sin \varphi' = -\ 9.7145$$
$$\log \rho \cos \varphi' = \ \ 9.9315$$

From the table of elements, page 407 . . . . . $H = +\ 0^{h}\ 27^{m}.4$
Hence, $h_0 = H - \lambda \quad = +\ 1^{h}\ 18^{m}.8$

From the table we find the corrections to apparent conjunction for latitude $= 31^{\circ}$; $h_0 = 1^{h}\ 20^{m}$; $x' = 0.522$, to be 55^{m}.

Adding this to the time of geocentric conjunction, and then subtracting and adding half an hour, we have for the approximate Washington times, to be used in the computations,

Immersion, $\tau_1 = +\ 25^{m} = +\ 0^{h}.42$; $T =$ Jan. 1, $19^{h}\ 24^{m}.2$
Emersion, $\tau_2 = +\ 85^{m} = +\ 1^{h}.42$; $T =$ Jan. 1, $20^{h}\ 24^{m}.3$

	Immersion.	Emersion.
	h m	h m
h_0	+ 1 18.8	+ 1 18.8
τ, reduced to sidereal time	+ 25.1	+ 1 25.2
$h_0 + \tau$	+ 1 43.9	+ 2 44.0
$h_0 + \tau$ in arc	+ 25° 58′.5	+ 41° 0′.0
$\sin d$	− 9.2627	− 9.2627
$\cos d$	+ 9.9926	+ 9.9926
$\sin(h_0 + \tau)$	+ 9.6414	+ 9.8169
$\rho \cos \varphi' \sin d$	− 9.1942	− 9.1942
$\cos(h_0 + \tau)$	+ 9.9537	+ 9.8778
$\log \xi$	+ 9.5729	+ 9.7484
$\log \rho \cos \varphi' \sin d \cos(h_0 + \tau)$	− 9.1479	− 9.0720
$\log \rho \sin \varphi' \cos d$	− 9.7071	− 9.7071
$\log \rho \cos \varphi' \cos(h_0 + \tau)$	+ 9.8852	+ 9.8093
$\log \rho \sin \varphi' \sin d$	+ 8.9772	+ 9.9772
$\log \xi' = [9.4192]\ \rho \cos \varphi' \cos(h_0 + \tau)$	+ 9.3044	+ 9.2285
$\log \eta' = [9.4192]\ \rho \cos \varphi' \sin d \sin(h_0 + \tau)$	− 8.2548	− 8.4303

	Immersion.	Emersion.
$\rho \sin \varphi' \cos d$	$-$ 0.5094	$-$ 0.5094
$-\rho \cos \varphi' \sin d \cos (h_0 + \tau)$	$+$ 0.1406	$+$ 0.1180
η	$-$ 0.3688	$-$ 0.3914
$x = x' \tau$	$+$ 0.2176	$+$ 0.7400
ξ	$+$ 0.3740	$+$ 0.5603
$x - \xi$	$-$ 0.1564	$+$ 0.1797
$y = Y + y' \tau$	$-$ 0.3991	$-$ 0.5632
η	$-$ 0.3688	$-$ 0.3914
$y - \eta$	$-$ 0.0303	$-$ 0.1718
x'	$+$ 0.5224	$+$ 0.5224
ξ'	$+$ 0.2016	$+$ 0.1692
$x' - \xi'$	$+$ 0.3208	$+$ 0.3532
y'	$-$ 0.1641	$-$ 0.1641
η'	$-$ 0.0180	$-$ 0.0269
$y' - \eta'$	$-$ 0.1461	$-$ 0.1372
$\log m \sin M$	$-$ 9.1942	$+$ 9.2545
$\log m \cos M$	$-$ 8.4814	$-$ 9.2350
$\log \tan M$	$+$ 0.7128	$-$ 0.0195
$\log n \sin N$	$+$ 9.5062	$+$ 9.5480
$\log n \cos N$	$-$ 9.1647	$-$ 9.1374
$\log \tan N$	$-$ 0.3415	$-$ 0.4106
M	259° 2′	+133° 43′
N	114 29	111 14
$M - N$	144 33	22 29
$\log \sin (M - N)$	9.7634	9.5825
$\log m$	9.2022	9.3955
$\log n$	9.5471	9.5785
$\log n'$	7.7689	7.8003
$\log \sin \psi$	9.5306	9.5430
$\log \cos (M - N)$	$-$ 9.9110	9.9657
$\log \frac{m}{n'}$	1.4333	1.5952
$\log \cos \psi$	9.9735	9.9718
$[9.4350] \div n'$	1.6661	1.6347
$-\frac{m}{n'} \cos (M - N)$	$+\ 22^{\mathrm{m}}.1$	$-\ 36^{\mathrm{m}}.4$
$\frac{[9.4350]}{n'} \sin \psi$	± 43.6	± 40.4
t_1	$-$ 21.5	$+$ 4.0
t_2 (inaccurate)	$+$ 65.7	$-$ 76.8
Washington conjunction $+ \tau$	19 24.2	20 24.3
Washington mean time of phase	19 2.7	20 28.3
$-\lambda$	$+$ 51.4	$+$ 51.4
Cordoba mean time of phase	19 54.1	21 19.7

These times may now be corrected in the way described for the eclipses, but for the purposes of prediction this correction need be executed only for the emersion.

For the position angles from the north point of the moon's limb toward the east we have

	Immersion.	Emersion.
N	114° 29′	111° 14′
ψ	160 10	20 26
	− 180 0	+ 180 0
P	94 39	311 40

Prediction of Many Occultations for a Given Place.—When it is desired to predict all the occultations which will be visible at some one place, tables may be constructed and applied in such a way as to greatly diminish the labor of computation. In using such tables the most convenient course will be to find for each occultation the hour-angle of the star at the moment of apparent conjunction in right ascension, as seen from the place of observation. The table of elements, pages 407—432, gives H, the Washington hour-angle at the moment of geocentric conjunction. The corresponding geocentric hour-angle at the place will be—

$$h_0 = H - \lambda \qquad (\lambda = \text{west longitude from Washington}).$$

The moment of apparent conjunction, as seen from the station, will be given by the condition $\xi = x$; or, using the values of ξ and x,

$$\rho \cos \varphi' \sin h = x' \tau$$

h being the west hour-angle of the star at the moment in question, and τ the interval, in hours of mean time, which has elapsed since geocentric conjunction. We shall therefore have,

$$h = h_0 + \tau$$

for the hour-angle at the end of the interval τ after geocentric conjunction. In strictness, τ should here be multiplied by the factor $1 + \frac{1}{365.25}$, because the star moves a little more than 15° in an hour of mean time; but the error arising from the neglect of the factor is too small to be important, as it will affect the predicted time of conjunction by less than 10 seconds. The equation for finding τ is therefore,

$$\rho \cos \varphi' \sin (h_0 + \tau) = x' \tau$$

The quantities h_0 and x' being derived immediately from the data of the Ephemeris, the quantity τ is readily obtained by successive approximation, and may be tabulated as a function of h_0 and x'. The computation of τ is effected as follows. We have

$$\sin (h_0 + \tau) = \sin h_0 + 2 \sin \tfrac{1}{2}\tau \cos (h_0 + \tfrac{1}{2}\tau) \qquad (1)$$

The value of τ in arc being seldom more than 24° we may put τ itself for $2 \sin \frac{1}{2}\tau$. The equation will then become

$$\rho \cos \varphi' \sin h_0 + \tau \rho \cos \varphi' \cos (h_0 + \tfrac{1}{2}\tau) = x' \tau$$

from which we find

$$\tau = \frac{\rho \cos \varphi' \sin h_0}{x' - k \rho \cos \varphi' \cos (h_0 + \frac{1}{2}\tau)} \qquad (2)$$

To tabulate τ, we must first have a table of the quantities

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin h \\ \xi' &= [9.41916]\, \rho \cos \varphi' \cos h \end{aligned} \qquad (3)$$

which table may be formed for every 10 minutes (in time) of h. If we then put ξ_0 for the value of ξ corresponding to $h = h_0$, and ξ'_1 for the value of ξ' corresponding to $h = h_0 + \frac{1}{2}\tau$, we shall have

$$\tau = \frac{\xi_0}{x' - \xi'_1} \qquad (4)$$

Since we must know the value of τ, approximately, before we can take ξ'_1 from the table, this equation can be solved only by successive approximations. The approximations converge so rapidly as to offer no difficulty. It will be best to begin by computing values of τ for the two extremes of x', namely, $x' = 0.48$ and $x' = 0.60$, because the approximate values of τ can then be interpolated for all intermediate values of x'. For the first approximation may be taken—

$$\begin{aligned} \tfrac{1}{2}\tau &= 50^{\mathrm{m}} \sin \frac{4}{3} h_0 \quad (\text{for } x' = 0.48) \\ \tfrac{1}{2}\tau &= 40^{\mathrm{m}} \sin \frac{4}{3} h_0 \quad (\text{for } x' = 0.60) \end{aligned} \tag{5}$$

or, the approximate values of τ may be taken from Mr. Downes's table, just given. It will be best to make the computation for every 30 minutes of h_0, and to find the intermediate values of τ for every 10^{m} by interpolation. Then for each 30^{m} of h_0 we take ξ' from a table with the argument $h_0 + \frac{1}{2}\tau$, and log ξ with the argument h_0, and thence compute τ by (4). If the value of τ thus arrived at differs more than 3^{m} from that employed in taking out ξ', a new value may be used to correct ξ', and the computation may be repeated. The values corresponding to $x'=0.51$, $x' = 0.54$, and $x' = 0.57$ can then be computed with the single interpolation of approximate values of τ, and afterward the table can be extended by interpolation to every 0.01 of x' between $x' = 0.48$ and $x' = 0.62$. It will be best to compute τ in the first place to every 0.001 of an hour, and to drop the last figure in forming the definitive table. We shall call this Table I.

The values of η and of η' may then be tabulated for every degree of the star's declination, and every 10^{m} of h. It will not be really necessary to compute the table for negative values of d, since by putting

$$\begin{aligned} \eta_1 &= \rho \sin \varphi' \cos d \\ \eta_2 &= -\rho \cos \varphi' \sin d \cos h \end{aligned}$$

η_1 may be given in a table of single-entry; and taking η_2 from the table of double-entry for a positive d we shall have

$$\eta = \eta_1 \pm \eta_2$$

the lower sign being used for a negative d. But the extension of the table for η to negative values of d is so readily made that it will probably be found better to do it, so as to save taking out η_1 and η_2 separately.

We shall call this table for η *Table II*, and the corresponding one for η' with the same arguments *Table III*. The precepts for using the tables will then be as follow:—

From Table I with the arguments x' and $H - \lambda = h_0$ take out the value of τ. It will be sufficient to use the nearest 0.01 of x'. τ will be of the same sign as h_0. Then, enter Table II with the arguments d (the star's declination) and $h = h_0 + \tau$, and take out the value of η. Form the quantities $y = Y + y'\tau$, and $y - \eta$. If the latter quantity lies between the limits ± 0.28, it is almost certain that there will be an occultation. If it falls without the limits ± 0.33, it is almost certain that there will not be an occultation. Between the years 1881 and 1890 these last limits may be reduced to ± 0.32, and cases near this limit may be rejected if y' is small. A convenient rule to adopt will be—

$$\begin{array}{rll} y' < 0.10, & \text{limits} = \pm 0.29 \\ 10 < y' < 0.15, & \text{limits} = \pm 0.30 \\ 15 < y' < 0.20, & \text{limits} = \pm 0.31 \\ 20 < y' & \text{limits} = \pm 0.33 \text{ or } \pm 0.32 \end{array}$$

Here, only the absolute value of y' is to be considered, without respect to its algebraic sign.

If $y - \eta$ falls between the limits thus indicated, take the values of ξ' and η' from their appropriate tables and compute v, Q and $\triangle$ from the equations

$$\begin{aligned} v \sin Q &= y' - \eta' \\ v \cos Q &= x' - \xi' \\ \triangle &= (y - \eta) \cos Q \end{aligned}$$

If $\Delta > 0.2723$ or $\log \Delta > 9.4350$ there will be no occultation, or, at best, the moon will only graze the star when $\Delta - 0.2723$ is very small. If $\Delta < 0.2723$, compute

$$\tau_1 = -\frac{y - \eta}{v} \sin Q \qquad \cos P = \frac{\Delta}{0.2723} \quad (P < 180^\circ)$$

$$\tau_2 = \frac{0.2723 \sin P}{v}$$

We shall then have—

Local mean time of immersion, $T - \lambda + \tau + \tau_1 - \tau_2$
Local mean time of emersion, $T - \lambda + \tau + \tau_1 + \tau_2$
Position angle from north toward east at immersion, $Q + P$
Position angle from north toward east at emersion, $Q - P$

In predicting the occultations for a given place, the first operation will be to go over the list of occultations in the Ephemeris, and select those which may be visible. The conditions of possible visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the day time.

The most convenient course will be to write the value of $-\lambda$ on the bottom of a sheet of paper, and, passing through the list of occultations, pause over each one for which condition (1) is fulfilled, and examine whether conditions (2) and (3) are fulfilled. If either fails, the computer passes on. Very often it will require some examination to find whether $H - \lambda$ or $T - \lambda$ falls within the limits: in these cases, the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

Phenomena of Planets and Satellites, pages 436—467.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness.

Disks of Mercury and Venus, pages 436 and 437.—The angle θ, needed in reducing meridian observations, is the same as the position angle of the great circle drawn from the planet through the sun, diminished by 90°. This position angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star.

Satellites of Jupiter, pages 439—461.—The times of phenomena are explained at the foot of each page; the diagrams, on page 439.

Phenomena, pages 468 and 469.—The conjunctions, quadratures, etc., of the planets are in longitude, but the conjunctions of the moon with the planets are in right ascension.

Latitude by Observed Altitude of Polaris.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874—1881, and is intended for use at sea and reconnaissance on land. It will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1883.

The adopted constants of precession, nutation, and aberration are those of **Struve** and **Peters**, namely:

$$\begin{aligned} \text{Precession} &= 50''.2411 + 0''.0002268\ t \\ \text{Nutation} &= 9.2231 + 0.000009\ \ t \\ \text{Aberration} &= 20.4451 \end{aligned}$$

in which t is the number of years after 1800.0.

The obliquity of the ecliptic is that of **Hansen**'s *Tables du Soleil*, which is 0''.32 greater than that of **Peters**, used in the issues of this Ephemeris preceding that of 1882. A comparison of **Hansen**'s mean obliquity with that of **Peters** and **Le Verrier** at different epochs is given in the following table:

Epoch.	Hansen.			Peters.	Le Verrier.	H.—P.	H.—L.
	°	′	″	″	″	″	″
1750	23	28	18.19	17.44	19.42	+0.75	—1.23
1800	23	27	54.80	54.22	55.63	+0.58	—0.83
1850	23	27	31.42	30.99	31.83	+0.43	—0.41
1900	23	27	8.02	7.76	8.03	+0.26	—0.01

The formulæ for reduction of places of the fixed stars, page 280, correspond to the *Star Tables of the American Ephemeris*, Washington, 1869.

The mean right ascensions of stars have been reduced to **Newcomb**'s fundamental standard, in the catalogue attached to the *Washington Observations for* 1870, Appendix II, with the following exceptions: The right ascensions of the 48 circumpolar stars north of 60° north declination are from Dr. **Gould**'s *Standard Places of Fundamental Stars*, second edition, United States Coast Survey Office, 1866. Of the twelve stars south of 50° south declination, the positions of β Hydri, α Trianguli Australis, and σ Octantis, have been corrected from data furnished by Dr. **Gould**; while the remaining nine are, as before, from the *British Nautical Almanac* for 1848.

The right ascensions of additional stars in the general list, for which no apparent places are given in the subsequent section, have been taken partly from an unpublished investigation of the positions of the zodiacal stars, partly from the catalogue of the Astronomische Gesellschaft of 1878, and a few have been derived from recent catalogues without a rigorous reduction for equinox.

The mean declinations of stars are taken from Boss's paper in the *Report of the Northern Boundary Commission*, Washington, 1879, for all stars found therein. The declinations of all the other stars have been reduced to the same standard, except those of the additional ones above, which have been taken partly from the Astronomische Gesellschaft list, and partly from places in recent catalogues. To the apparent places of Sirius and Procyon have been applied the periodic corrections resulting from **Auwers**'s investigations.

The values of these corrections are:—

Year.	Sirius.		Procyon.	
	s	"	s	"
1883.0	$\Delta\alpha = -0.036$	$\Delta\delta = -1.43$	$\Delta\alpha = -0.026$	$\Delta\delta = +0.97$
1884.0	$\Delta\alpha = -0.019$	$\Delta\delta = -1.41$	$\Delta\alpha = -0.016$	$\Delta\delta = +1.00$

The ephemeris of the sun is constructed from **Hansen** *and* **Olufsen**'s *Tables du Soleil*, Copenhagen, 1853, except that **Struve**'s aberration has been used. This is equivalent to adding 0″.19 to the true longitudes, but does not affect the right ascensions and declinations. The sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned} X &= R \cos\lambda \\ Y &= R \sin\lambda \cos\omega - 19.3\, R\, \beta \\ Z &= R \sin\lambda \sin\omega + 44.5\, R\, \beta \end{aligned}$$

The reductions to mean equinox, 1883.0, are computed by the formulæ,

$$\begin{aligned} \Delta X' &= + Y \sec\omega\, \Delta\lambda \\ \Delta Y' &= - X \cos\omega\, \Delta\lambda + \quad \Delta\omega - \ \ 9.4\, \tau\, R \sin(\odot + 187^\circ) \\ \Delta Z' &= - X \sin\omega\, \Delta\lambda - Y\, \Delta\omega + 21.7\, \tau\, R \sin(\odot + 187^\circ) \end{aligned}$$

in which λ and β are the longitude and latitude of the sun referred to the equinox and ecliptic of the date; ω, the obliquity of the ecliptic; $\Delta\lambda$, the reduction of longitude for precession and nutation from January 0; $\Delta\omega$, the reduction of the mean to the apparent obliquity; and τ, the part of the year since January 0. The numerical coefficients are in units of the seventh place of decimals. The correction for latitude has been taken from **Goetze**'s paper in the *Astronomical Journal*, Vol. II, page 71.

The mean equatorial horizontal parallax of the sun, adopted from Professor **Newcomb**'s *Investigation of the Distance of the Sun and the Elements which depend on it*,* is 8″.848. The adopted semidiameter of the sun at the earth's mean distance is 16′ 2″. In the computations pertaining to eclipses, **Bessel**'s semidiameter, 15′ 59″.788 has been used.

The right ascension, declination, and parallax of the moon are derived from **Hansen**'s *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with **Newcomb**'s *Researches on the Motion of the Moon*, Part I, p. 268,† and a corrected table being substituted for Table XXXIV.

The semidiameter of the moon is computed from the moon's horizontal parallax by the formula,

$$S = 0.272274\, \pi + 2''5$$

The constant 2″.5 should be omitted in the computation of eclipses and occultations as due entirely to telescopic and ocular irradiation.

The ephemeris of Mercury is derived from Professor **Winlock**'s *Tables of Mercury*, Washington, 1864. They are based on the older theory of **Le Verrier**, published in the Additions to the *Connaissance des Temps* for 1848.

The ephemeris of Venus is derived from Mr. G. W. **Hill**'s *Tables of Venus*, Washington, 1872.

The ephemeris of Mars is derived from manuscript tables constructed from **Lindenau**'s Tables. Mr. **Hugh Breen**'s results, contained in his paper *On the Corrections of* **Lindenau**'s *Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX, have also been discussed and applied; and **Le Verrier**'s secular variations of the elements are likewise adopted. The following are the corresponding corrected elements and annual variations for Washington, 1855.0:—

$$\begin{array}{lcrrrcrl} & & {}^{\circ} & {}' & {}'' & & {}'' & \\ L & = & 320 & 13 & 33.87 & + & 689101.1527 & t \\ \pi & = & 333 & 23 & 17.84 & + & 65.9990 & t \\ \Omega & = & 48 & 25 & 55.29 & + & 27.6997 & t \\ i & = & 1 & 51 & 2.20 & - & 0.02141 & t \\ e & = & \multicolumn{3}{r}{19238''.75} & + & 0.18549 & t \\ n & = & \multicolumn{3}{r}{689050''.8927} & & & \\ a & = & \multicolumn{3}{l}{1.5236915} & & & \end{array}$$

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* *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1865, Appendix II.

† *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1875, Appendix II.

The ephemeris of Jupiter is derived from manuscript tables constructed from Bouvard's Tables, with such changes as were required to make them correspond more nearly to the formulæ.

The ephemeris of Saturn is derived from a provisional theory constructed by Mr. George W. Hill, and still unpublished.

The ephemerides of Uranus and Neptune are derived from Professor Newcomb's Tables, published by the *Smithsonian Institution.*

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3″.34	0.00	Le Verrier, *Theory of Mercury.*
Venus	8.546 ± 0.086	0.00	Peirce, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Mars (polar)	2.842 ± 0.057	0.25	
Jupiter (polar)	18.78 ± 0.067	0.70	
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the sun and occultations of stars by the moon are adapted to Bessel's method, using the special forms in Chauvenet's *Spherical and Practical Astronomy.* The adopted semidiameters are:—

Semidiameter of the sun at distance unity. . . .	959″.788
Ratio, radius of moon: radius of earth	0.27227

The eclipses of Jupiter's satellites are computed from Todd's *Continuation of* Damoiseau's *Tables,* Washington, 1876. The occultations, transits, etc., are computed from Woolhouse's Tables, *British Nautical Almanac* for 1835, Table II of each satellite having been adapted to Damoiseau's Tables.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables by Professor Newcomb.

The apparent elements of the rings of Saturn are computed from Bessel's data, except those for the dusky ring.

The elongations of the satellites of Uranus, and of the satellite of Neptune are prepared from the data of Professor Newcomb's *Uranian and Neptunian Systems,* Washington, 1875.

In compiling the positions of observatories, the latest available data have been used. The positions have been furnished, in many instances, through the courtesy of the directors of the Observatories, in response to a circular issued by the Superintendent of the American Ephemeris. The following results of Dr. Albrecht's adjustment, *Astronomische Nachrichten,* Band 95, col. 129, have also been adopted:—

	m s
Berlin — Greenwich	— 53 34.908
Berlin — Paris	— 44 13.883
Berlin — Vienna. . . .	+ 11 46.312
Berlin — Altona	— 13 48.555
Berlin — Wilhelmshaven . .	— 20 59.700
Berlin — Leiden. . . .	— 35 38.557
Berlin — Bonn	— 25 11.615
Berlin — Manheim . . .	— 19 44.392
Berlin — Strassburg . . .	— 22 30.206
Berlin — Munich . . .	— 7 8.778
Berlin — Leipzig . . .	— 4 0.891
Berlin — Göttingen . . .	— 13 48.666

The reduction to geocentric latitude, and the logarithm of the radius of the earth are computed from the elements of the terrestrial spheroid derived by Bessel, as adapted in Table III of Chauvenet's *Spherical and Practical Astronomy,* Vol. II:—

$$\log e = 8.9122052$$

$$\varphi' - \varphi = -11' 30''.65 \sin 2\varphi + 1''.16 \sin 4\varphi$$

$$\log \rho = 9.9992747 + 0.0007271 \cos 2\varphi - 0.0000018 \cos 4\varphi$$

Table IV, for finding the latitude from an observed altitude of Polaris, is constructed for—

(1) An altitude of Polaris equal to 45°.
(2) A declination of Polaris equal to + 88° 41′ 20″.

The directions for using the table are adapted to a right ascension of Polaris equal to $1^h\ 16^m.4$. Somewhat greater accuracy may be insured by substituting the right ascension of Polaris at the date of observation, from pages 302—313 of this volume.

The principal computations of the Ephemeris have been distributed in the following manner:—

The sun has been computed by Mr. EASTWOOD; the moon's longitude, latitude, semidiameter and horizontal parallax, by Professor KEITH; right ascension and declination, by Professor VAN VLECK; culminations, by Professor RUNKLE; lunar distances, by Mr. W. B. OLIVER; Mercury and Venus, by Mr. AUSTIN; Mars and Uranus, by Mr. FERREL; Jupiter, by Professor KENDALL; Jupiter's Satellites, by Mr. W. F. McK. RITTER; Saturn, by Mr. G. W. HILL and Mr. R. BUCHANAN; Neptune, by Mr. WIESSNER. The fixed stars have been prepared by Mr. WIESSNER, Mr. LOOMIS, and Dr. TOWNSEND; the general constants for their reduction, by Mr. FERREL; the occultations, by Mr. DOWNES assisted by Mr. WIESSNER; and the eclipses have been computed and the charts projected by Mr. BUCHANAN.

TABLE I.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

Approximate Interval.		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1 0	2 0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$0^{\text{h.}}$	$1^{\text{h.}}$	$2^{\text{h.}}$	$3^{\text{h.}}$	$4^{\text{h.}}$	$5^{\text{h.}}$	$6^{\text{h.}}$	$7^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54 718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Side-real.	$0^{\text{h.}}$	$1^{\text{h.}}$	$2^{\text{h.}}$	$3^{\text{h.}}$	$4^{\text{h.}}$	$5^{\text{h.}}$	$6^{\text{h.}}$	$7^{\text{h.}}$	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$8^{\text{h.}}$	$9^{\text{h.}}$	$10^{\text{h.}}$	$11^{\text{h.}}$	$12^{\text{h.}}$	$13^{\text{h.}}$	$14^{\text{h.}}$	$15^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Side-real.	$8^{\text{h.}}$	$9^{\text{h.}}$	$10^{\text{h.}}$	$11^{\text{h.}}$	$12^{\text{h.}}$	$13^{\text{h.}}$	$14^{\text{h.}}$	$15^{\text{h.}}$	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
Side-real.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$0^{\mathrm{h.}}$	$1^{\mathrm{h.}}$	$2^{\mathrm{h.}}$	$3^{\mathrm{h.}}$	$4^{\mathrm{h.}}$	$5^{\mathrm{h.}}$	$6^{\mathrm{h.}}$	$7^{\mathrm{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162
Mean Solar.	$0^{\mathrm{h.}}$	$1^{\mathrm{h.}}$	$2^{\mathrm{h.}}$	$3^{\mathrm{h.}}$	$4^{\mathrm{h.}}$	$5^{\mathrm{h.}}$	$6^{\mathrm{h.}}$	$7^{\mathrm{h.}}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$8^{\mathrm{h.}}$	$9^{\mathrm{h.}}$	$10^{\mathrm{h.}}$	$11^{\mathrm{h.}}$	$12^{\mathrm{h.}}$	$13^{\mathrm{h.}}$	$14^{\mathrm{h.}}$	$15^{\mathrm{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	$8^{\mathrm{h.}}$	$9^{\mathrm{h.}}$	$10^{\mathrm{h.}}$	$11^{\mathrm{h.}}$	$12^{\mathrm{h.}}$	$13^{\mathrm{h.}}$	$14^{\mathrm{h.}}$	$15^{\mathrm{h.}}$	For Seconds.	

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TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	

TABLE IV.—LATITUDE BY POLARIS.

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to local sidereal time.

If the sidereal time is
- less than $1^h\ 16^m.4$, subtract it from $1^h\ 16^m.4$;
- between $1^h\ 16^m.4$ and $13^h\ 16^m.4$, subtract $1^h\ 16^m.4$ from it;
- greater than $13^h\ 16^m.4$, subtract it from $25^h\ 16^m.4$;

and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV, and add it to or subtract it from the true altitude, according to its sign. The result is the latitude of the place.

Example.—1883, November 10, at $9^h\ 27^m\ 27^s$, P. M., mean solar time, in longitude 27° east of Greenwich, suppose the true altitude of Polaris to be 27° 27′: required the latitude of the place.

	h m s
Local astronomical mean time	9 27 27
Reduction from Table III, for $9^h\ 27^m\ 27^s$	+ 1 33
Greenwich sidereal time of mean noon, November 10, page 183 .	15 17 12
Reduction from Table III, for longitude (= $1^h\ 48^m$ east, or minus)	— 0 18
Sum (having regard to signs) equals local sidereal time . .	0 45 54 = $0^h\ 45^m.9$
	h m
	1 16.4
Subtract sidereal time	0 45.9
Remainder equals hour-angle of Polaris	0 30.5

True altitude	+27° 27′.0
Correction from Table IV. . .	— 1 18.0
Sum equals latitude . . .	+26 9.0

TABLE IV—1883.

Hour-Angle.	$0^{h.}$		$1^{h.}$		$2^{h.}$		$3^{h.}$		$4^{h.}$		$5^{h.}$	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	−1 18.7	0.0	−1 15.9	0.5	−1 7.9	0.9	−0 55.2	1.3	−0 38.6	1.5	−0 19.5	1.6
5	1 18.7	0.1	1 15.4	0.5	1 7.0	0.9	0 53.9	1.2	0 37.1	1.6	0 17.9	1.7
10	1 18.6	0.1	1 14.9	0.5	1 6.1	1.0	0 52.7	1.3	0 35.5	1.5	0 16.2	1.7
15	1 18.5	0.1	1 14.4	0.6	1 5.1	1.0	0 51.4	1.4	0 34.0	1.5	0 14.5	1.7
20	−1 18.4	0.2	−1 13.8	0.6	−1 4.1	1.0	−0 50.0	1.3	−0 32.5	1.6	−0 12.8	1.7
25	1 18.2	0.2	1 13.2	0.7	1 3.1	1.0	0 48.7	1.4	0 30.9	1.6	0 11.1	1.8
30	1 18.0	0.2	1 12.5	0.7	1 2.1	1.1	0 47.3	1.4	0 29.3	1.6	0 9.3	1.7
35	1 17.8	0.3	1 11.8	0.7	1 1.0	1.1	0 45.9	1.4	0 27.7	1.6	0 7.6	1.7
40	−1 17.5	0.3	−1 11.1	0.7	−0 59.9	1.1	−0 44.5	1.4	−0 26.1	1.7	−0 5.9	1.7
45	1 17.2	0.4	1 10.4	0.8	0 58.8	1.2	0 43.1	1.5	0 24.4	1.6	0 4.2	1.7
50	1 16.8	0.4	1 9.6	0.9	0 57.6	1.2	0 41.6	1.5	0 22.8	1.6	0 2.5	1.8
55	1 16.4	0.5	1 8.7	0.8	0 56.4	1.2	0 40.1	1.5	0 21.2	1.7	−0 0.7	1.6
60	−1 15.9		−1 7.9		−0 55.2		−0 38.6		−0 19.5		+0 0.9	

Hour-Angle.	$6^{h.}$		$7^{h.}$		$8^{h.}$		$9^{h.}$		$10^{h.}$		$11^{h.}$	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	+0 0.9	1.7	+0 21.2	1.7	+0 40.0	1.5	+0 56.1	1.2	+1 8.4	0.8	+1 16.1	0.4
5	0 2.6	1.8	0 22.9	1.7	0 41.5	1.5	0 57.3	1.2	1 9.2	0.8	1 16.5	0.4
10	0 4.4	1.7	0 24.6	1.6	0 43.0	1.4	0 58.5	1.1	1 10.0	0.8	1 16.9	0.3
15	0 6.1	1.7	0 26.2	1.6	0 44.4	1.4	0 59.6	1.1	1 10.8	0.7	1 17.2	0.3
20	+0 7.8	1.7	+0 27.8	1.6	+0 45.8	1.4	+1 0.7	1.1	+1 11.5	0.7	+1 17.5	0.3
25	0 9.5	1.7	0 29.4	1.6	0 47.2	1.3	1 1.8	1.0	1 12.2	0.6	1 17.8	0.3
30	0 11.2	1.7	0 31.0	1.5	0 48.5	1.3	1 2.8	1.0	1 12.8	0.6	1 18.1	0.2
35	0 12.9	1.7	0 32.5	1.5	0 49.8	1.3	1 3.8	0.9	1 13.4	0.6	1 18.3	0.1
40	+0 14.6	1.6	+0 34.0	1.5	+0 51.1	1.3	+1 4.7	1.0	+1 14.0	0.6	+1 18.4	0.1
45	0 16.2	1.7	0 35.5	1.5	0 52.4	1.3	1 5.7	0.9	1 14.6	0.5	1 18.5	0.1
50	0 17.9	1.6	0 37.0	1.5	0 53.7	1.2	1 6.6	0.9	1 15.1	0.5	1 18.6	0.1
55	0 19.5	1.7	0 38.5	1.5	0 54.9	1.2	1 7.5	0.9	1 15.6	0.5	1 18.7	0.0
60	+0 21.2		+0 40.0		+0 56.1		+1 8.4		+1 16.1		+1 18.7	